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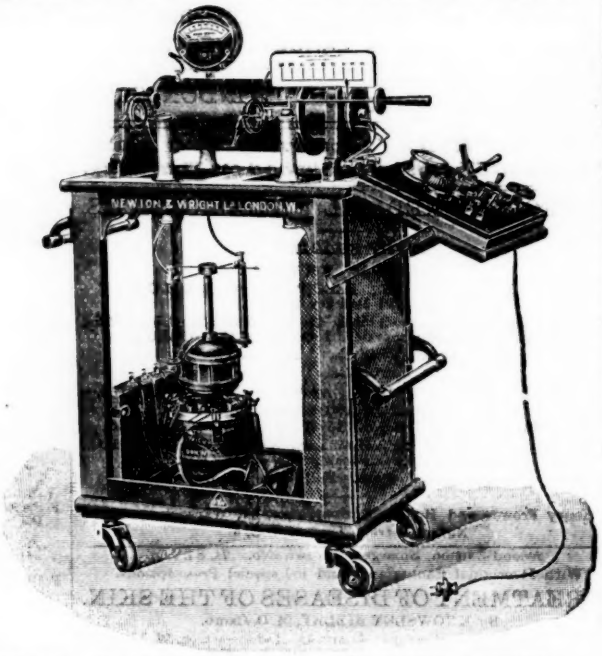

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LECTURE II.*

CLINICAL PICTURE.

INCUBATION.

MR. PRESIDENT, CENSORS, AND FELLOWS OF THE COLLEGE,—The incubation period has been variously stated to be from one day up to as long an interval as 30 days, most writers inclining to a period of four or five days, and very few regarding it as long as 10 days. These estimates have been based on the interval between known contact with a case or a recognised carrier and the appearance of symptoms, but the cases with an apparently long incubation period are open to the fallacy that they may have come in contact with an unknown carrier in the interval. A more accurate basis for deciding the incubation period would be provided by determining the average duration of the period that meningococci are present in the naso-pharynx before symptoms of systemic infection appear. There are not many observations bearing on this point. It is generally agreed that the disease very rarely attacks carriers; and chronic carriers, as shown by Gates,[37] contain immune bodies in the blood and so may be regarded as more or less protected. Among 485 carriers under the observation of Fildes and Baker[30] no case of cerebro-spinal fever occurred; and these writers, having examined with a negative result 26 men who subsequently contracted the disease, conclude that carriers seldom develop the disease, and that the period of time between the acquisition of the meningococcus and the onset of the disease must usually be short. Out of these 26 cases five were examined within a week of the onset, eight during the second week, and four in the third week before the onset. The general opinion, as voiced by von Lingelsheim, Gordon, and Andrewes, is that meningococci are constantly present in the throat at the onset of the disease, and that every case arises in a carrier. Fildes and Baker's observations, as far as they go, are certainly compatible with the view that the incubation period is very short and need not be more than a day or two, but their failure to find any meningococci in the throats of persons who afterwards contracted the disease is exceptional, for other observers with much smaller series of cases have usually been able to point to some examples of known carriers contracting the disease; thus, among Martin Flack's[32] 135 carriers 4 developed the disease during isolation.

ONSET.

The usual onset is much like that of ordinary "influenza," and is sudden, with headache, fever, and vomiting, the symptoms becoming progressively worse, so that in 24 hours meningitis is suggested. Sometimes after this mode of onset the symptoms rather suddenly advance, so that in a short time—an hour or two—the patient is comatose or delirious; in young children, and occasionally in adults, the onset may be marked by convulsions. On the other hand, after the onset there may be a fallacious improvement for a day or two, as if the blood invasion were yielding to the forces of natural immunity, and then meningitic symptoms appear. The catarrhal onset lasting some days is more gradual, and it is a question whether the meningococcic invasion is superimposed on an ordinary catarrh or whether the catarrh is the first manifestation of meningococcic invasion of the throat—the first or catarrhal stage of cerebro-spinal fever described by some writers.

The acute or fulminating onset is the least frequent; it may take various forms. It may be maniacal, imitating delirium tremens, attended by convulsions suggesting epilepsy, by hallucinations or syncope, or the patient may be unconscious when first seen. In patients found unconscious, or in the apoplectic mode of onset, the diagnosis is obviously very difficult; in some instances the patient has fallen out of bed or out of his hammock, and the question of fractured base has arisen. This apoplectiform onset may be rapidly followed by death, and thus accounts for cases of sudden death unexplained until examination after death shows the presence of the meningococci in the central nervous system.

With severe hæmic infection the manifestations are those of grave toxæmia, approaching the typhoid state, often at the outset with a subnormal temperature, which subsequently rises rapidly, quick pulse and respirations, vomiting, and a hæmorrhagic rash. Sudden cardiac collapse and fatal syncope at the onset of meningitis are specially described by Sainton.[108] The initial shock may be considerable, and when accompanied by vomiting, abdominal pain, and diarrhœa may suggest an acute abdominal lesion such as appendicitis or perforation, and laparotomy has naturally been performed (St. Clair Symmers[105]). One such case in the Navy was operated upon for a supposed perforated gastric ulcer and found to have a normal abdomen; at the suggestion of the anæsthetist, Temporary Surgeon Commander C. W. Morris, lumbar puncture was at once performed and turbid fluid containing meningococci obtained. The association of a hæmorrhagic rash with an acute abdominal onset may present the clinical picture of Henoch's purpura.

The occurrence of cases with this abdominal onset might, perhaps, suggest that infection entered through the alimentary canal, but the frequency with which the medulla of the adrenals is disorganised with hæmorrhage would satisfactorily explain the collapse, and by stimulation of the adjacent sympathetic plexus the acute abdominal symptoms; this interpretation gains support from the acute abdominal crises occasionally seen in Addison's disease. It should be added that alarming collapse may be induced by moving the patient to hospital.

CLINICAL FORMS.

The manifestations are protean and as a result of differences in the clinical features numerous forms have been described, mainly on the basis of the rate at which the disease runs its course. Cerebro-spinal fever, like acute poliomyelitis, has two distinct phases: (*a*) the general or systemic infection; and (*b*) the localisation in the meninges. The evidence of systemic infection is usually prominent in the initial stages and the process is then commonly extremely acute, but it may continue for weeks, and in rather rare instances chronic septicæmia follows meningitis.

A most important factor influencing the course and type of the disease is the serum treatment. Absence of or inefficient serum treatment is responsible for fatal results either early in the disease or after a chronic illness due to adhesions or chronic septicæmia. The different types of cerebro-spinal fever show transitional forms, and description of the forms is apt to be artificial and confusing, as a single case may appear to belong to two. Further, the clinical picture of the disease is often abruptly changed by unexpected alterations, such as improvement or the onset of grave symptoms. The following forms of cerebro-spinal fever will be briefly mentioned without a detailed description, and to avoid repetition the symptoms will be mainly dealt with subsequently: (1) fulminating; (2) ordinary acute; (3) abortive; (4) chronic: (*a*) septicæmic, (*b*) encysted or loculated meningitis, variety posterior basic meningitis of infants.

Fulminating Form.

Fulminating cases, fatal within 48 hours or less from the onset, are extremely dramatic and from their rapid course are often of medico-legal interest and the subjects of inquests. These cases are said to be more frequent early in the course of epidemics. The onset is sudden with symptoms of intense poisoning, collapse, vomiting, and severe headache. A purpuric eruption is almost constant, the hæmorrhagic areas sometimes increasing so rapidly in size that their progress can be watched with the eye; but labial herpes, which usually appears on the fourth day of the disease, is hardly ever seen. Diarrhœa, acute abdominal pain, and coffee-ground vomit from the gastric extravasations are occasionally present.[46] Headache may be absent,

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and the temperature, though usually raised, may be low as the result of the collapse. A peculiar smell has been described (Neave [70]), but I have not noticed it.

Two groups of fulminating cases with transitions between them have been described, especially by MacLagan [66]: (1) the purely septicæmic cases without meningitis characterised by rigors, prostration, cyanosis, cardiac failure, and mental clearness to the end; and (2) the cases with purulent meningitis in which unconsciousness rapidly sets in and passes into coma. In a number of fulminating cases meningococci, though not found in the cerebro-spinal fluid drawn off during life, can be isolated from the cerebral ventricles or base of the brain after death, thus showing the transition from the general to the local infection. The most rapidly fatal cases are those with general infection only. Purpura occurs in both, and the symptoms of collapse have been correlated with the hæmorrhagic condition of the adrenal medulla, for which, as for the other nervous tissues, the meningococcus has a predilection (MacLagan).

The fulminating cases have been thought to be less often seen in young children and infants than in older persons, but possibly some at any rate of the rapidly fatal cases of adrenal hæmorrhage in infants are of this nature. Andrewes,[3] finding the adrenals sterile bacteriologically, suggested the possibility of hæmorrhagic small-pox, but some of those less thoroughly examined may have been meningococcic. In the fulminating cases meningococci may be found in the blood by smears or blood cultures, and the proper treatment is intravenous injection of serum in large quantities.

Ordinary Acute Form.

The ordinary acute cases pass by transitions into those called by Netter and Debré [70] the hyperacute on the one hand and into the mild cases on the other. The onset is sudden, and after a short interval meningitic symptoms appear—stiffness and retraction of the neck, very violent headache, Kernig's sign—and a state of cerebral irritation supervenes, passing if unrelieved by treatment into coma. Energetic treatment has a dramatic effect, but recrudescences of the symptoms from reinfection, either from the naso-pharynx or from some localised focus in the meninges which is not reached by the intrathecal injection of serum, may occur. Some cases, because the treatment is begun late or is not efficient, become chronic from the formation of adhesions, obstruction of the cerebral ventricles, and hydrocephalus.

Abortive Forms.

The word "abortive" has been employed in two different ways:—

(*a*) As applied to cases in which the cerebro-spinal fever does not go any further than the septicæmic stage, the blood infection subsiding under the influence of natural immunity before meningeal invasion occurs, so that in 24 to 48 hours the illness may be quite over. These cases are analogous to the frequent abortive cases of acute poliomyelitis. This is the sense in which the term "abortive" has more recently been employed. Clinically these cases may appear as febrile purpura, a form described elsewhere. Herrick refers to a case with the clinical features of a subacute polyarthritis, and says that there may be meningism. Abortive meningococcæmia was discussed in the first lecture.

(*b*) As describing abortive meningitis, the symptoms, though appearing suddenly, rapidly subside after two to six days. It is in this sense that "abortive" is used by Netter and Debré and by various British writers. These cases are prone to relapse. Abortive cases appear to be more frequent towards the end of epidemics, possibly because they are then more easily detected. Culpin [22] described very mild cases characterised by slow pulse, and says that the cerebro-spinal fluid may be lymphocytic and show an occasional meningococcus or be negative.

Chronic Forms.

The chronic forms of cerebro-spinal fever may be divided into (1) cases which are not treated, or, if treated, do not receive the appropriate serum so that the meningococcic infection continues unaffected; (2) cases with meningococcic septicæmia which may precede, follow, or occur without meningeal infection; these conditions were described in the first lecture; (3) cases with meningitic adhesions and obstruction to the free circulation of cerebro-spinal fluid, so that parts of the cerebro-spinal subarachnoid space or the cerebral ventricles become cut off and form closed cavities inaccessible to serum injected intrathecally in the ordinary way. This encysted or loculated form of meningococcic meningitis, of which posterior basic meningitis of infants is a variety, probably accounts for most of the chronic cases, and as the adhesions are likely to form if serum treatment be delayed or inefficient it may include many of the chronic cases mentioned above in which the serum treatment has for one cause or another not been successful.

Encysted, loculated meningitis; closed ventricular meningitis; ventriculitis; ependymitis; pyocephaly; hydrocephalus.—These various names are applied to loculation or shutting off of some part of the space containing the cerebro-spinal fluid. As a result of a large quantity of fibrin the spinal subarachnoid space may be divided into two parts; the lower one can be drained by ordinary lumbar puncture and the meningococcic infection brought under the influence of antimeningococcic serum, whereas in the part above the obstruction the meningitis continues and keeps up the symptoms. This condition is characterised by a want of correspondence between the character of the cerebro-spinal fluid, which may be clear, free from meningococci, or obtainable in a few drops only, and the symptoms which persist. Lumbar puncture performed above the obstruction gives exit to turbid cerebro-spinal fluid containing meningococci.

More often meningitis seals the communications—the foramina of Magendie and Luschka—between the ventricles and the subarachnoid space, and as a result the ventricles, if infected (ependymitis), become distended with turbid fluid or pus which may be extremely thick (pyocephaly), or, if not infected or the infection dies out, simply show chronic hydrocephalus with clear sterile fluid. Very rarely cerebral or subdural abscesses containing meningococci may be found; Hallez [42] mentions three examples. On account of the small size of the foramina and the frequency of delay in diagnosis and treatment in the very young blocking of the ventricular exits is more likely to occur in infants and children than in adults. An interesting point arises as to the time that it takes for the obstruction to the ventricular foramina to be established; usually the symptoms do not appear until the primary acute attack is subsiding or is over, but they may begin quite early, and possibly in some instances the meningococcic infection starts in, and is confined to, the choroid plexuses of the lateral ventricles, the spread of infection being prevented by rapid closure of the foramina. In rare instances one lateral ventricle only is dilated.

In cases with closed infected cerebral ventricles lumbar puncture and intrathecal injection of antimeningococcic serum may cure the spinal meningitis but cannot influence the meningococcic infection of the cerebral ventricles. On lumbar puncture the cerebro-spinal fluid may be small in amount, at the most not more than 20 c.cm., or there may be none. The fluid may be clear with a predominance of lymphocytes and a normal power of reducing Fehling's solution, and does not correspond to the degree of the clinical symptoms, thus showing that there is not an ordinary recrudescence of the cerebro-spinal meningitis. In spite of intensive intrathecal serum treatment the symptoms characteristic of ventricular infection and distension persist; these are excessive wasting, although the patient may take food well, bedsores, incontinence of urine and fæces, headache, vomiting, mental torpor passing into semi-coma, hyperæsthesia, Macewen's sign, rigidity and contractions, paralyses, diminution or loss of vision and hearing, nystagmus, dilated and sluggish pupils, and irregularities of respiration. The temperature varies; it may be intermittent, with wide oscillations or crises, or irregular, or there may be no fever at all. The symptoms may show remarkable intermissions. Patients with encysted meningitis may react violently to injections of serum given in the site of an ordinary lumbar puncture, with appalling headache ascribed to engorgement of the choroid plexuses and increased intraventricular pressure. The outlook is bad unless the shut-off spaces be tapped, and when there is meningococcic infection serum injected; but sometimes, although the course is long with repeated lumbar punctures, the obstruction of the foramina of the ventricles spontaneously passes off, causing relief of the symptoms.

The preventive treatment is the early start of vigorous and effective serum treatment. Measures to prevent blocking of the subarachnoid space and the formation of adhesions

are washing out the intrathecal space with saline or solution of sodium citrate before the injection of serum. The treatment, puncture of the ventricles, and injection of serum in case of ependymitis, and drainage alone in aseptic hydrocephalus is mentioned elsewhere.

Posterior basic meningitis of infants is chronic encysted meningococcic meningitis in young infants, and its special features appear to depend on the early age of the patients rather than on any peculiarity in the infecting organism. More than 20 years ago Still[109] showed that the disease was due to a micro-organism almost identical with the meningococcus, and of late years it has become recognised that there is no constant bacteriological distinction between the meningococcus of posterior basic meningitis and that of cerebro-spinal fever in later life. But Andrewes[4] states that serologically the meningococci may be of a different strain from those of the epidemic disease in adults, and Lieutenant-Colonel M. H. Gordon kindly informs me that the meningococci in posterior basic meningitis do not differ serologically from those in adult cases, except that some, which are more difficult to identify, are usually atypical specimens of his Group IV.

With regard to the modifying influence of age, it is, of course, the rule that infections run a more rapid course in early that in late life, but it has seemed to me that both meningococcic and tuberculous meningitis are exceptional in the more rapid course in adults than in infants. This may to some extent depend on the expansile skull of the infant which prevents the intracranial and intraventricular pressure from becoming excessive so rapidly as in the adult or adolescent. Among the cases called posterior basic meningitis half occur under six months of age, three-quarters within the first year, and practically all under the age of two years, but there is no essential difference between the condition of closed meningococcic infection of the cerebral ventricles in infants and in adults.

The disease is sporadic and may arise at any time of the year, but, as in later life, most of the cases occur in the first half of the year; among F. E. Batten's[9] 85 cases, 54, or 63·5 per cent., occurred during the first five months of the year. Though a matter of common knowledge, the disease is not very common; thus, writing in 1898, Still found that at the Hospital for Sick Children, Great Ormond-street, during the previous ten years, a period when the disease must have been exciting much attention, 49 cases only came to necropsy.

It may be well to mention the main clinical features differentiating the clinical form called posterior basic meningitis from ordinary cerebro-spinal fever in adults: 1. The chronicity of the disease, for acute cases of meningococcic meningitis do not come under this heading. 2. The rarity of eruptions; among Hildesheim's[47] 100 cases there was no example of a purpuric rash, and herpes was present in two cases only. In November, 1918, Dr. Claude Ker showed me a case of posterior basic meningitis of three months' duration with profuse infra-orbital herpes during a recrudescence. An ill-defined erythema occurs in a few cases. 3. Amaurosis or loss of vision without objective changes in the retina or optic nerve is common; it was noted in 37 out of Hildesheim's 100 cases. 4. The rarity of deafness and the occasional presence of auditory hyperacuity. 5. The prominence of opisthotonos, due to the greater flexibility of the spinal column. 6. Joint infection appears to be usually peri-arthritic rather than intra-arthritic, and may be associated with pseudo-glioma or the opacity of the vitreous caused by meningococcic invasion and imitating a glioma.

In the early stages the disease may be very difficult to recognise, as fever, tremor of the limbs, and some bulging of the anterior fontanelle may be the only symptoms. In such cases Zingher[113] urges that a dry or sterile lumbar puncture should be the indication for tapping the ventricles and daily intraventricular injection of serum until the fluid is sterile. According to Batten, 50 per cent. of the patients survive, and of these 15 per cent. recover completely, while the remaining 35 per cent. are left with blindness, hydrocephalus, and varying degrees of mental deficiency.

CEREBRO-SPINAL FLUID.

The characters of the cerebro-spinal fluid vary at different periods of the disease, and changes in its naked-eye appearances may occur rapidly. During the first 24 hours the fluid may be perfectly clear; according to Netter and Debré this holds good in 75 per cent. of the cases. The clear fluid may be free from meningococci, the pre-meningitic or septicæmic stage, but it may, as shown by films and especially by culture, contain meningococci. Although the fluid first drawn off may be free from meningococci, that coming off a little later from the cranial or ventricular cavities may show meningococci. In other instances the fluid, though at first turbid, is subsequently clear, as if the meningitis started in the region of the cord rather than, as is probably usually the case, in the choroid plexuses of the lateral ventricles. The pressure is increased, but this may also occur in meningism and it is reasonable to believe that in the earliest stages of cerebro-spinal fever there may be meningism or toxic irritation of the meninges without microbic invasion.

The turbidity of the cerebro-spinal fluid varies from opalescence to very thick pus running with difficulty through the trocar. Admixture with blood is nearly always due to trauma during lumbar punctures, and in such cases the fluid at subsequent punctures is yellow from changes in the hæmoglobin (erythrochromia). In some instances a golden yellow cerebro-spinal fluid contains so much protein that it coagulates at once (Froin's syndrome); this is explained by Hanes[43] as due to stasis of the cerebro-spinal fluid in a cul-de-sac of the meninges with escape of blood plasma from the damaged blood-vessels of the pia-arachnoid, this xanthochromia being different from erythrochromia in which the remains of red blood corpuscles can be seen. A yellow colour is also seen in chronic cases with intrathecal adhesions preventing the passage of serum to the skull; lumbar puncture a day or two later gives exit to the serum which has this yellow tinge (Chiray[17]). The outlook in cases with adhesions is bad, and Forbes and Adam[35] found that the cases with Froin's syndrome were all fatal. Clotting after withdrawal, apart from that due to accidental admixture with blood, is evidence of some form of meningitis, and has been minutely studied by Connal.[19] It appears with the slightest opacity, varies with the degree of turbidity, and persists after the fluid has become practically clear. He describes several varieties of clot in meningococcic meningitis, which are always softer and more friable than in the tuberculous form.

The intrathecal pressure is greatest in the early stages of the disease, and gradually falls with the amelioration of the symptoms. But in the late stages of hydrocephalus, and when there are adhesions cutting off the lower from the upper parts of the intrathecal space, little cerebro-spinal fluid can be withdrawn by lumbar puncture.

Chemical Characters.

Chemically albumin is absent from normal cerebro-spinal fluid, but appears as the result of meningitis, and its amount is a prognostic index, a small content in the early stages pointing to a mild attack and an increasing quantity causing anxiety. In the acute stage the quantity of albumin is large and fluctuates, whereas in chronic cases it is less and does not vary so much (Connal). The globulin present normally in minute quantities in cerebro-spinal fluid is increased in meningitis.

The reducing power of the normal fluid is usually lost; this has been explained as due to fermentation of the dextrose by the meningococci with liberation of lactic acid and a diminution in the alkalinity of the cerebro-spinal fluid (Connal), and it has been stated that in aseptic purulent meningitis the reducing power of the cerebro-spinal fluid is not affected. This, however, is disputed by Weissenbach and Mestrezat,[110] who find that diminution or loss of the reducing power varies directly with the cell content of the cerebro-spinal fluid, thus suggesting that the advent of leucocytes is responsible for the fall in the glucose content of the cerebro-spinal fluid.

Weil[109] finds that irritation of the meninges, however induced, and the resulting congestion are always accompanied by an increase in the glucose content of the cerebro-spinal fluid; this is what would occur in meningism. But if the irritation be of microbic origin the amount of glucose is diminished. Hence the glucose content varies at different stages of the disease; very early in the course of cerebro-spinal fever when the cerebro-spinal fluid is clear the glucose content is increased; later it disappears, but as convalescence begins it reappears and for a time becomes

excessive, just as in the preliminary stage, as the result of the meningeal congestion and its predominance over bacterial activity.

In chronic cases the meningococci may lose their power of fermenting dextrose, and the cerebro-spinal fluid, although opalescent and containing meningococci, reduces Fehling, and becomes more alkaline than during the acute stage. The presence or absence of the reducing power of the cerebro-spinal fluid has been utilised as a clinical test for distinguishing the meningism sometimes seen as a manifestation of serum disease in patients who have had intrathecal injections of antimeningococcic serum from a true relapse of the infection, in which event the reducing body is absent (Reveillet, Nové-Josserand, and Langeron [58]).

Microscopical Characters.

In the very early stage there is an increase in the small number of lymphocytes normally present. In some exceptional cases there is a well-marked lymphocytosis at the stage, but, if the patient survive, this is succeeded by the ordinary polymorphonuclear predominance (Dopter). In chronic cases with hydrocephalus in adults and in the posterior basic meningitis of infants, which is a chronic meningococcic meningitis, the cells are mainly lymphocytes. With these exceptions the leucocytes are polymorphonuclears, which at first constitute 95 per cent. or more of the cells; as improvement occurs the number diminishes, and in favourable cases there may, on the fifth day of treatment, be 50 per cent of polymorphonuclears and 50 per cent. of lymphocytes, and later the eosinophils may increase at the expense of the other leucocytes until almost all the cells are eosinophils (Bloch and Hébert [12]).

In addition to leucocytes the cerebro-spinal fluid contains large mononuclear cells constituting, according to Netter and Debré, 5 to 20 per cent. of the cells; they may be enormous, as large even as 20 to 40 leucocytes, are phagocytic, and are derived from the connective tissue cells and lymph spaces of the pia arachnoid.

The meningococci may be extracellular or intracellular, and their number does not correspond to the clinical symptoms. Gordon's [39] remarks suggest that lysis of the meningococci and liberation of endotoxin may account for the difficulty in finding meningococci in severe cases.

MIXED AND SECONDARY INFECTIONS.

In addition to the meningococcus the cerebro-spinal fluid may show various micro-organisms, such as the tubercle bacillus, the pneumococcus, the influenza bacillus, streptococci, and staphylococci. Among 339 cases in the Navy there were 8 of this kind, 4 with streptococci, 3 with pneumococci, and 1 with tubercle bacilli; such cases are, of course, usually fatal, and recovery occurred in one case only, with pneumococcic infection present at the first lumbar puncture.

The commonest secondary infection appears to be pneumococcic; Netter and Salanier [59] met with 22 cases of secondary pneumococcic infection among patients with meningococcic meningitis treated by intrathecal injections of serum during the first four months of 1917, when from the increased incidence of primary pneumococcic meningitis since December, 1916, the virulence of the pneumococcus was presumably intensified. These authors suggest that the injection of serum into the subarachnoid space, especially when large quantities of serum not corresponding to the type of the meningococcus present are given, may provide a better culture medium and so favour pneumococcic infection. But a mixed meningococcic and pneumococcic infection of the meninges may occur before lumbar puncture, as was found in a naval case; and it would appear that secondary pneumococcic infection depends mainly on the virulence of the pneumococcus, for in a previous series of 300 cases of meningococcic meningitis Netter and Salanier [51] found four cases only of secondary pneumococcic infection. On the other hand, it must be remembered that horse serum causes an aseptic meningitis and facilitates the passage of micro-organisms from the blood through the meninges. In order to prevent this secondary infection these authors advise the addition to the antimeningococcic serum of antipneumococcic serum. But this would be likely to be effective only if the pneumococcus were Type I. and the corresponding serum, which is the effective one, employed.

Fitzgerald,[31] who reports 12 cases of meningococcic meningitis, three of which were also infected with pneumococci, suggests that this secondary infection is commoner than is usually recognised, and quotes Mervyn Gordon's opinion that it occurs in 5 per cent. of the cases. He points out that unless the lumbar puncture fluid is bacteriologically tested on each occasion cases may easily be missed, and thus the real reason for ascribed failures of serum treatment be undetected. All the reported cases of combined meningococcic and pneumococcic infection, with the exception of three recorded by Netter and Salanier, proved fatal.

Combined *tuberculous* and meningococcic infection of the meninges is very rare. Of the recorded cases Bériel and Durand [10] accept eight only. Sophian has never seen such a combination among 300 cerebro-spinal fluids examined from cases of tuberculous meningitis, and states that no such coincidence has been established in New York. The interesting question arises as to the relation in point of time between these two infections. On general grounds it would appear probable that the more acute meningococcic is implanted on the tuberculous infection (Lutaud [63]), but the opposite view—namely, that meningococcic infection facilitates tuberculosis of the meninges has found supporters. Thus, Sainton,[28] in recording two cases of this double meningitic infection with old tuberculous lesions in the lungs suggests two alternatives: (1) that the meningococcic infection led to transfer of the tubercle bacilli to the meninges; and (2) that the active meningeal reaction due to intrathecal injections of serum awoke old tuberculous lesions there.

Streptococcic infection may spread from the lumbar puncture wound, be due to otitic infection, or arise without any obvious focus of infection. Mixed infections may occur in cases of ear disease; thus, Jaffé [54] records a case of a soldier with chronic otitis in whom after death suppuration of the right lateral sinus and pus at the base of the brain containing meningococci, streptococci, and staphylococci were found. Lüdke [62] mentions cases of bacteriologically proved meningococcic meningitis in which blood cultures, though negative for meningococci, showed streptococci or staphylococci.

RASHES.

The incidence of rashes varies in different epidemics; thus, in one of the earliest accounts of the disease North says that hæmorrhages, which in 1806–07 marked almost every case, were rarely observed in 1808–09. Writing in 1911, Netter and Debré stated that eruptions have been, generally speaking, commoner in Britain and America than in Germany, and especially in France,

In the years before the war rashes were very rare in sporadic cases in adults and were hardly ever seen in children, but during the increased prevalence since 1914 rashes—and at present I am not including herpes—have been common; thus, among 502 cases in the Royal Navy during the first four years of war there were 296, or 59 per cent., with rashes. In France also purpura has become more frequent during the war, and Netter [71] has suggested that this may be correlated with Dopter's observation that whereas before the war the infecting strain of meningococcus was in 96 per cent. of cases Type A (Gordon's I. and III.), during the war, Type B (Gordon's II. and IV.) has become equally if not more important, and that the increased frequency of meningococcæmia is also thus explained. In her thesis on the purpuric forms of meningococcæmia Mlle. Blanchier [11] has brought forward some evidence in favour of this view; out of 10 cases she was able by examination of fluid or blood from the hæmorrhagic areas to determine that in 5 cases the infecting meningococcus belonged to Type B. (Gordon's Types II. and IV.) and in 1 case to Type A (Gordon's I. and III.).

This is, perhaps, the most convenient place to refer to the cases of meningococcic purpura without meningitis. Among 277 cases Netter had 19 of meningococcic purpura without meningitis, and states that it has become commoner and that as bullæ can be raised by friction over the purpuric areas more easily than in other forms, this may be utilised to determine the strain of the infecting organisms and so enable the corresponding serum to be selected. Surgeon-Lieutenant-Commander D. H. C. Given [38] described a series of febrile purpuric cases, many of which I saw, arising in connexion with cases of cerebro-spinal fever in the *Powerful* establishment at Devonport; in only 3 of these could meningococci be cultivated and none of them could be

identified with Gordon's types. Meningococcic purpura may be associated with pain in the joints and synovitis.

Varieties of Rashes.

The cutaneous rashes accompany or closely follow the onset of the disease. They appear on the first or second day of the disease and are comparable to the rose spots of enteric fever. There is almost always an interval of two to three days between the appearance of the initial rash and of labial herpes in cases which show both.

The characteristic rash is hæmorrhagic, and may be either small and petechial, resembling that in malignant endocarditis, or purpuric like that in the malignant forms of the exanthemata and acute lymphocytic leukæmia. Sir William Osler has told me of an Oxford undergraduate who died within 24 hours of fulminating septicæmic cerebro-spinal fever; microscopically Dr. A. G. Gibson found the blood-vessels of the skin crowded with meningococci. The prognostic significance of the petechiæ and the large purpuric areas differ; the large purpuric areas are characteristic of the fulminating cases, whereas the petechiæ are not of grave omen. The rash may be petechial or purpuric from the start, or the petechial character may supervene on an erythematous, papular, rose-spot, macular, or blotchy eruption. According to Herrick the large purpuric areas are independent of, and do not spread from, the petechiæ. The non-hæmorrhagic rash may not undergo any further change. In one naval case the rash almost disappeared directly after lumbar puncture. Among 339 naval cases during the second, third, and fourth years of the war there were hæmorrhagic rashes in 153 and non-hæmorrhagic in 42. The erythematous rash has been described as transient and is seldom recorded. Occasionally the initial rash is described as urticarial.

The rose spots, papules, and petechiæ are presumably embolic and evidence of the stage of septicæmia or blood invasion. They are more prone to occur in parts exposed to friction, especially the joints; in some instances the hæmorrhagic eruption may be partly vesicular, in others bullæ may form over purpuric areas, and in one such case in the Navy a pure culture of meningococci was obtained from the fluid. In rare instances ulceration may supervene in large hæmorrhagic areas, and yet recovery follow (Gordon,[10] Bovaird,[13] Robb,[20] Elliott and Kaye,[26] and a naval case). Trophic bullæ may form on various parts of the body, such as the fingers, and, according to Fairley and Stewart,[28] are sterile. These observers divide the rashes into (1) primary—namely, the purpuric, petechial, and macular, due to septicæmia; and (2) the secondary, which do not appear until after the third day of the disease and are regarded as toxic. Of the latter class they describe the "elbow sign," which consists of a flush on the extensor surface of that joint and also above the great trochanter of the femur, generally combined with a condition of "hæmorrhagic goose skin." This description applies to a condition commonly recognised, but regarded as the petechial rash on points of pressure and aggravated by friction. The appearance is well shown in Plates II. and III. of Foster and Gaskell's Monograph in patients dying on the second and fourth days of the disease. Fairley and Stewart contest its relation to pressure.

Herpes.

Herpes is a well-recognised event in cerebro-spinal fever and may be considered under the two heads of (1) ordinary febrile herpes labialis; and (2) herpes of the zoster type.

Herpes labialis appears to occur with varying frequency in different epidemics, and the relative incidence of herpes labialis and of other cutaneous eruptions shows similar fluctuations; from a review of the literature up to 1898, Councilman, Mallory, and Wright[21] concluded that herpes is far commoner than any other eruption. Netter[74] found that herpes occurred in a third of his cases and was more frequent than purpura, and Sainton[98] states that it was present in two-thirds of his cases. High estimates were also given by Leichtenstern (90 per cent.), Leyden (75 per cent.), Tourdes (60 per cent.), and Friis (54 per cent.). On the other hand, Stillé[104] says that in the Massachusetts epidemic herpes was infrequent and much less often present than cutaneous rashes; in 502 naval cases there were 117, or 23 per cent., with herpes and 296, or 59 per cent., with rashes. As herpes labialis ordinarily is prone to occur again and again in certain persons, it is possible that its incidence in cerebro-spinal fever is to some extent determined by personal idiosyncrasy. Out of the 117 cases of herpes in the Navy, 96, or 82 per cent., had in addition an initial rash (54), a serum rash (31), or both (11).

Labial herpes appears later than the initial rash and usually on the fourth day of the disease, but it may occur earlier, on the second day, or be postponed until later; in two naval cases it came out with the serum rash on the eighth and tenth days of the disease, and may then be regarded as part of the serum disease rather than of cerebro-spinal fever. In rare instances it may recur during continued fever, with a recrudescence of symptoms, or with the appearance of some complication. It is unusual in children and exceptional in infants; among Robertson's[92] 66 cases under 16 years of age it did not occur, but it was noted in four out of 33 children under 4 years of age reported by Mitchell and Falkener,[67] and in 15 out of 48 children and in two out of 21 infants collected by Collette;[14] among the naval cases which range from 15 years upwards age did not exert any obvious influence.

The causation of ordinary herpes labialis is undecided; it is not generally thought to be associated with any lesion of the central nervous system, though Howard,[45] from histological examination of the Gasserian and other ganglia, considers that the herpes of pneumonia and cerebro-spinal fever has a similar anatomical basis to that of herpes zoster. Though frequently looked for, meningococci have very seldom been isolated from the vesicles of labial herpes (Durand, von Drigalski), but Durand[24] argues that the meningococci may be overgrown by secondary infections. Clinically the appearance of herpes on the fourth day of the disease, some days after the initial rash which is presumably due to emboli of meningococci, militates against the view that these two eruptions are due to the same mechanism. It has, however, been suggested that the vesicles are due to meningococci, and their situation determined by inflammation of the Gasserian ganglion. As herpes labialis has been seen in persons reacting vigorously to prophylactic antimeningococcic vaccines (Gates[37]) it appears to me reasonable to refer it to the local action of toxins rather than of bacteria in the skin. The vesicles commonly occur on both lips and may extend out on to the cheeks and nose (facial herpes), so that sometimes it is difficult to determine where labial herpes and herpes due to implication of the fifth nerve begin and end.

Herpes of the zoster type occurs in cerebro-spinal fever, but much less often than labial herpes. The two forms may be present at the same time; thus labial herpes and herpes of the external ear due to inflammation of the geniculate ganglion of the facial nerve (Ramsay Hunt[50]), or labial herpes and herpes of the neck may be combined. Herpes of the face due to inflammation of the Gasserian ganglion of the trigeminal may be very profuse, or single branches may be picked out; I have seen nasal herpes without ulceration of the cornea; Ballantyne[5] describes herpes of both eyelids on one side. Herpes of the limbs is rare; Robb[20] refers to cases, Netter and Debré[77] figure bilateral herpes on the backs of the thighs, and Sainton describes a case with supra- and infra-orbital herpes and a few vesicles on the dorsum of the hand. It would be interesting to have figures to show the date of the appearance of herpes zoster; my impression is that it occurs earlier than the labial form.

NERVOUS SYMPTOMS.

Nervous symptoms are predominant at the onset of meningitis; severe headache, vomiting, and mental stupor or delirium are usually present and there may be wild mania, symptoms suggesting delirium tremens, or epileptic seizures. The mental disturbances during the septicæmic stages, and before meningeal infection has occurred, are probably toxic and comparable to those at the commencement of other acute infections, such as pneumonia. Incontinence of urine and fæces is common. Swallowing may be difficult, either from œsophageal spasm or paresis, and is probably more frequent than the notes of cases show. Among the 502 naval cases it was mentioned in 8 (5 fatal). In a case recorded by McConnell, Morris, and Seehorn[64] œsophageal spasm was so obstinate that gastrostomy was done, death following 12 hours later. General hyperæsthesia is not uncommon.

The condition of the *reflexes* varies; the deep reflexes are often exaggerated and an extensor response may be present; among 398 naval cases Babinski's sign was noted in 35, or 8·8 per cent.; it may be obtained on one side only. Herrick[44] insists that whereas in other acute infections the

deep reflexes may be equally exaggerated on the two sides, in cerebro-spinal fever there is a notable inequality. It is stated that in the most severe cases both the superficial and deep reflexes may be abolished, but it is doubtful if any stress can be laid on this; among 21 naval cases in which the knee-jerks were noted to be absent there were 8 deaths. It may be mentioned that the knee-jerks are often absent in pneumonia and may be exaggerated or absent in enteric fever. Kernig's sign and rigidity of the neck are practically constant when meningitis has appeared, and are so well known that they will not be further discussed here.

Facial paralysis is rare; it appears early and is transient. Among 502 naval cases it was recorded in 7, but among Robb's 230 cases there were 11 examples. *Aphasia*, probably due to local pressure from exudation, may occur. Among 502 naval cases it was recorded in 5, in 2 of which it was transient; the other cases were fatal. Among Robb's cases there were 3 of aphasia.

Paraplegia.

Paraplegia is rare; among 502 naval cases it was noted in 1; among more than 400 cases MacLagan found it in 3, 2 of which recovered; there was one example among Robb's 230 cases and none among 120 cases that recovered and were analysed by Worster-Drought.[11a] It may be either organic or in very rarely recognised instances functional.

Organic paraplegia is described by Sophian[102] as either (1) spastic with ataxia, clonus, extensor plantar response, no sensory changes, and no vesical disorder; or (2) flaccid with absence of reflexes and sensory changes. Of the spastic form Sophian has seen 12 cases, presumably due to the pressure of exudate around the cord some way above the cauda equina. The general experience is that the paraplegia slowly improves, and this is in favour of the view that most of the cases are due to the pressure of exudate and not to extensive matting of adhesions and invasion of the substance of the cord by inflammatory products (meningomyelitis). But sometimes the paraplegia is permanent, and this condition would be expected to be due to lesions of another kind. Thus Carnegie Dickson[23] found extensive softening of the cord, usually in the upper dorsal or lower cervical region. In chronic distension of the ventricles rigid paraplegia may be met with. Foster and Gaskell mention two cases resembling disseminated sclerosis. Flaccid paraplegia may apparently be due to matting of the cauda equina in a mass of adhesions. Herrick[43] describes a case with hæmorrhagic purulent exudate—a condition resembling the radiculitis responsible for flaccid monoplegias.

Functional paraplegia.—In convalescents the gait is naturally at first impaired, and as the patients may be unduly susceptible to auto-suggestion hysterical paraplegia may result. Hurst[31] records such a case in which a soldier, finding that in the early stages of convalescence walking was painful, gave up the attempt. The central nervous system was free from organic disease, and a rapid cure was effected by vigorous persuasion.

Hemiplegia.—Monoplegias.—Nerve Deafness.

Hemiplegia is rare and, like paraplegia, may be organic or functional. Among the 502 naval cases it occurred in 12, 10 of which proved fatal. Robb found 4 cases of hemiplegia among 230 cases at Belfast. In fatal cases cerebral softening, compression of the cortex by masses of exudation, and cerebral hæmorrhage have been reported. The hemiplegia comes on during the acute disease and may appear a few days before death; if the patient recovers it may be permanent, but the tendency to improve in many patients who survive suggests that more of the reported hemiplegias may be functional than is realised. Beaussart[8] reports a case of cerebro-spinal fever in February, 1917, with functional hemiplegia the following July.

Monoplegias of the limbs due to inflammation of the nerve roots (radiculitis) as they pass through the meninges are described by Netter and Debré. They are even rarer than hemiplegia, occur earlier, are accompanied by wasting, pain, loss of reflexes and of sensation, but they usually disappear. Some only of the muscles of the limb may be affected. Sophian, however, states that monoplegias occur late in the course of the disease. These flaccid monoplegias must be differentiated from those due to acute poliomyelitis, which have not the same tendency to recover.

Nerve deafness is not nearly so common now as it appears to have been formerly.

Thus, according to Hutt,[52] among 874 pupils in the London County Council schools for deaf children requiring tuition only 1 was due to cerebro-spinal fever. Among 502 Naval cases deafness occurred in 26; it is usually regarded as due to extension of inflammation from the meninges along the sheath of the auditory nerve and is permanent, but in 2 cases temporary deafness about the time of the serum rash was regarded by Temporary Surgeon-Lieutenant A. C. MacAllister as a toxic manifestation of serum disease.

Deafness may also be due to otitis media, which is not regarded as a common complication of cerebro-spinal fever; among 502 naval cases it was noted in 10. But some writers state that a mild form of otitis media is very common.

OCULAR SIGNS AND SYMPTOMS.

The *pupils* are usually dilated, due to irritation of the sympathetic, and when sluggish in addition point to increased intracranial pressure. The pupils may diminish in size and regain their activity after lumbar puncture and relief of pressure, and dilate when an attempt is made to straighten the head or to obtain Kernig's sign. In some acute cases the pupils are much contracted. Inequality of the pupils is fairly frequent, especially in bad cases; hippus is common but without any special significance.

Photophobia, said to be rare and thus to contrast with its frequency in tuberculous meningitis, was reported in 52, or 10 per cent., out of 502 naval cases, and was almost always an initial symptom. Among 73 cases specially examined Ballantyne[5] never found true photophobia, though spasm of the eyelids, usually associated with general hyperæsthesia, was very frequent, and he considers that this has probably been described as photophobia.

Conjunctivitis is not very common; it occurred in 5·6 per cent. of 502 naval cases, in 10, or 9 per cent., of Councilman Mallory, and Wright's[21] 111 cases, in 15, or 20 per cent., of Ballantyne's 73 cases, and in 20 per cent. of Fairley and Stewart's series. The pus may, but does not always, contain meningococci. According to Councilman, Mallory, and Wright suppurative conjunctivitis may be due to loss of sensation depending on destruction of the Gasserian ganglion. When occurring early in the course of the disease, as it commonly does about the second day, it is usually of little importance, but when it appears later it may be followed by panophthalmitis. A certain degree of conjunctival engorgement in association with vaso-dilatation of the face is common. Conjunctival hæmorrhages are sometimes present, and are important diagnostically, as they are practically never seen in other forms of meningitis. Among 339 naval cases conjunctival hæmorrhages were noted six times. Corneal ulcer may occur and show the meningococcus. The analogy of gonococcic arthritis in the newly-born, which may be secondary to conjunctival infection, is possibly paralleled by Miller's[68] case of an infant who when two weeks old had conjunctivitis followed in two weeks' time by meningitis.

Panophthalmitis is rare and is commonly unilateral; Levy[71] (of Essen) had the exceptional experience of seeing 9 cases, 8 unilateral, among 165 cases of the disease. Among the 502 naval cases it occurred in 7, or 1·4 per cent., and was bilateral in 2 and unilateral in 5, all on the right side; in this connexion attention may be drawn to Netter's suggestion that the position of the patient's head, on the right or left, determines the side on which unilateral panophthalmitis occurs. As long ago as 1867 Gordon[40] noticed the predominance of these infective conditions in the right eye. Councilman, Mallory, and Wright insist that, contrary to the firm belief of most ophthalmologists, panophthalmitis is not metastatic, but is due to direct extension of inflammation around the optic nerve and arteria centralis retinæ and give a figure in support of their contention. Herrick insists that the infection travels by the ciliary vessels and not by the sheath of the optic nerve. Panophthalmitis may begin at different dates; Netter and Debré mention the twelfth to the fifteenth day of the disease, but in two naval cases it began on the fourth and the eighth.

Suppuration in the orbit, a very rare complication, is regarded by Councilman, Mallory, and Wright as due to extension from the meninges, whereas Netter and Debré consider that the inflammation spreads from the accessory nasal sinuses.

Optic Neuritis and Other Nerve Lesions.

Optic neuritis is usually regarded as infrequent and thus contrasting with its incidence in tuberculous meningitis; among 389 cases obtained by adding together the series

reported by Ballantyne, Randolph, Travers Smith, Foster and Cooke, Uhthoff, and Heine, 39, or 10 per cent., had optic neuritis. On the other hand, Fairley and Stewart[28] report the result of a routine bi-weekly examination by Dr. Gault of 184 cases; of these, 116, or 63 per cent., had optic neuritis, and of these 78, or 67 per cent., had a rash, whereas of 68 cases without optic neuritis 32, or 47 per cent., had a rash, the conclusion being drawn that optic neuritis is specially related to septicæmia. In cases with internal hydrocephalus optic neuritis was almost always absent, and this is explained on the ground that when internal hydrocephalus is absolute there is no fluid in the subarachnoid space to distend the vaginal sheath of the optic nerve.

True *nystagmus* occurs in severe cases only, and by Fairley and Stewart is regarded as pathognomonic of internal hydrocephalus, and therefore of extremely grave prognosis. It must be distinguished from pseudo-nystagmus or jerky movements at the limit of fixation, which, according to Ballantyne, are without significance.

Strabismus, usually due to implication of the sixth nerve, is much less frequent than in tuberculous meningitis, and is usually transient. Ballantyne found that the squint was nearly always (14 out of 15 cases) spasmodic, and thus contrasted with the squints in tuberculous meningitis, which are much more commonly paralytic. Among 502 naval cases squints were noted in 59 cases, or 11·7 per cent.; among Robb's 230 cases in 28 per cent.; among Councilman, Mallory, and Wright's 111 cases in 25·3 per cent.; and in Ballantyne's 73 cases in 25·5 per cent. Among the 59 naval cases with strabismus 31, or 52·5 per cent., proved fatal. Strabismus is an early symptom, usually within the first week of the disease, whereas in tuberculous meningitis, strabismus is a late event.

Ptosis is much less frequent than strabismus; out of the 502 naval cases it was noted in 18, or 3·6 per cent., but 13, or 72 per cent., of these 18 cases terminated fatally. The mortality was thus 20 per cent. higher than in the squint cases; this may be correlated with the probable spasmodic nature of many of the squints and the paralytic origin of the ptoses.

Retraction of the upper eyelids may occur; among 73 cases Ballantyne noted it in 15, one of which also showed von Gräfe's sign. According to Batten[7] it is common as an early manifestation in posterior basic meningitis before hydrocephalus, of which it is a recognised result, has developed. It varies in degree and is exactly like that due to stimulation of the sympathetic, but is not necessarily associated with dilatation of the pupils.

Circulatory Symptoms and Complications.

Pericarditis is probably often latent, as it is found after death when previously unsuspected—an experience familiar in other conditions. Netter and Debré speak of pericarditis as a phenomenon almost confined to the post-mortem table, and some authors do not refer to it. Robb,[30] however, noted pericardial friction in 17, or 7·4 per cent., out of 230 cases, Herrick[41] refers to 11 cases among 265, and it was heard in 4 naval cases that recovered. Extensive pericardial effusion is rare, and it appears that the pericarditis is usually dry and fibrinous. In a case of Herrick's[41] 110 c.cm. of blood-stained purulent fluid, giving a pure culture of meningococci, were removed, and 30 c.cm. of serum injected into the pericardium with benefit. As subpericardial hæmorrhages are common after death in fulminating cases pericarditis of meningococcic origin is easily explained. In 1908 Duval[25] collected 5 cases of bacteriologically proved meningococcic pericarditis.

Endocarditis is probably not so rare as it has been stated to be, but the vegetations may be small and possibly are sometimes overlooked. Among Ivy Mackenzie and Martin's[61] 20 cases 2 had malignant endocarditis, and Krumbhaar and Cloud,[56] among 16 cases of cerebro-spinal fever, found 3 with acute vegetative endocarditis. Cases of meningococcic endocarditis without meningitis are much rarer and are referred to elsewhere. Cardiac murmurs, commonly at the apex and referable to muscular incompetence, are not infrequent. Among 339 naval cases this was noted in 16 (1 death). Permanent valvular lesions, though they might be expected from the occurrence of meningococcic endocarditis, must be very rare.

Phlebitis in the lower extremities has been reported in rare instances. Collette[18] describes the association with arthritis in a girl aged 2½ years.

The blood shows a polymorphonuclear leucocytosis of from 20,000 to 50,000, and, according to Koplik,[63] is over 25,000 in more than half the cases; in chronic cases the leucocytosis may fall to normal.

Pulse and Blood Pressure.

The pulse is usually regular though it may, especially in grave cases, be irregular. Like the temperature the pulse-rate may vary greatly within a short time. The outstanding feature about the pulse is that it is so often slow in relation to the temperature; thus in a naval chaplain who was maniacal in the early stage the temperature was 105° F. and the pulse 60. The slow pulse depends on vagal inhibition due to increased intracranial pressure. Sainton[98] states that in the early stage of the disease pressure on the eyelids does not modify the pulse, but that later and at the height of the disease this oculo-cardiac reflex is always positive, the pulse becoming slowed by 16 to 50 beats per minute, and that this shows that the usual slow pulse in cerebro-spinal fever is due to vagotonia. In fulminating and septicæmic cases the pulse is rapid, as in most other acute infections. In fulminating cases the pulse may become impalpable some time before death. In some cases the pulse is rapid during convalescence, probably from toxic changes involving either the myocardium or the nervous mechanism of the heart. This rapid pulse is sometimes seen in patients who have got up soon after the illness. Before death the pulse may become extremely rapid.

The arterial blood pressure, which has been specially studied by Sophian and more recently by Fairley and Stewart, is low in the septicæmic stage, and in the worst cases may be impossible to record, rises with the increased intracranial pressure accompanying the onset of meningitis, and may then be between 140 and 190 mm. Hg, and in internal hydrocephalus is almost always raised from pressure of the cerebro-spinal fluid on the floor of the fourth ventricle. During convalescence the blood pressure is, in the absence of complications, normal or subnormal. In the acute stage vaso-motor disturbance is often extremely well marked, the face is intensely and characteristically congested—more so than in most fevers. This may, perhaps, be correlated with the changes commonly found in the medulla of the adrenals. The *tache cérébrale* is usually well marked, but is not of any diagnostic value. Epistaxis is occasionally seen.

Temperature.

The temperature is very irregular and does not conform to any rule; probably every case has fever at some time during the course of the disease, but some charts show little or no elevation of the temperature. This may be because the temperature varies rapidly and it so happens that when it is taken it is not up. In cases with a very severe onset the temperature is often at first depressed from collapse and then rises so that hyperpyrexia may occur. A low temperature is said to be characteristic of the disease in elderly people. There may be extreme oscillations at very short intervals—a feature of some diagnostic value in the early stages according to Netter. In chronic septicæmia the temperature chart may imitate that of malaria or enteric, and in chronic loculated meningitis there may be irregular bouts of fever which in posterior basic meningitis have been described as crises due to increased intracranial pressure. In some acute cases there is agonal hyperpyrexia, in others a low temperature.

Pulmonary Complications.

Pulmonary complications in this country since the war have not been very common; bronchitis and broncho-pneumonia have been the most frequent and important. Bronchitis as a complication is dangerous and cases in which it appears after some days' illness with meningitis usually prove fatal. An initial bronchitis does not necessarily make the prognosis so grave. Pneumonia has been seen in some cases and it is known that pure meningococcic, as well as pneumococcic, pneumonia may complicate meningococcic meningitis and even occur without meningeal infection (Jacobitz[53]). Pneumonia may be present at the onset or appear later in the course of the disease.

Pleurisy may, of course, accompany pneumonia or broncho-pneumonia in the course of cerebro-spinal fever, but it may occur without any obvious lung lesion; this was noted in 3 out of 502 naval cases. Meningococcic pleurisy has been recorded by Herrick, but it may be due to other organisms; thus, Krumbhaar and Cloud mention a case with acute

staphylococcic pleurisy. Netter and Debré refer to a bilateral hæmothorax in a child with a purpuric eruption. In the past pulmonary complications have from time to time been prominent features in individual outbreaks, and recently Herrick found them not uncommon among 208 cases.

COMPLICATIONS INVOLVING THE ALIMENTARY CANAL.

Parotitis is rare; it may be due to an ascending infection from the mouth, as in other fevers and conditions in which the mouth is dry. It may be unilateral and be associated with suppuration in the neck or otitis, or be non-suppurative. In the pus of one of Fairley and Stewart's cases *Staphylococcus aureus* was found. But in a suppurative case Robb reported the presence of the meningococcus, and as this organism does not flourish in the saliva the infection may have been hæmic.

In the most severe cases there may be blood in the vomit and fæces, but rarely in considerable quantities. Diarrhœa is not uncommon as an initial symptom and, as mentioned elsewhere, abdominal symptoms may be so prominent as to suggest an acute perforation of the alimentary tract, appendicitis, or Henoch's purpura. Jaundice is quite exceptional, and one case of peritonitis is tabulated by Herrick.

LESIONS OF JOINTS.

Arthralgia, or pain in the joints like that of influenza, is common at the onset and in the early stage of the disease, but is often overshadowed by the more severe symptoms. It may, however, be the precursor of synovitis and then is presumably similar in nature. It may accompany a hæmorrhagic eruption on the skin, and is very probably due to meningococcic emboli and hæmorrhages in the synovial membranes of the joints.

Arthritis, or more often synovitis, is a recognised complication of cerebro-spinal fever, and may occur in meningococcic infection without meningitis; four cases of this nature have been reported by Cecil and Soper,[16] three by Sainton,[28] and two by Faroy and May[29]; it has been recorded in meningococcic purpura (Given[30]), and in such cases has sometimes been regarded as "peliosis rheumatica." It is due to meningococci carried to the joints by the blood stream, and may therefore be associated with other metastatic manifestations, such as irido-cyclitis, epididymitis and orchitis. In cases of meningitis with synovitis it is often found that there was an initial hæmorrhagic rash; this was so in 15 out of 16 naval cases in which the point was investigated. It usually occurs on the fourth, fifth, or sixth day of the disease, but it may precede other symptoms.

The incidence was estimated at from 10 to 15 per cent. by Sophian and from 5 to 20 per cent. by Roger,[31] but among 502 cases in the Navy it occurred in 24, or 4·8 per cent., and among Fairley and Stewart's 323 cases in 23, or 7 per cent. Among 902 other cases (Robb's, Herrick's, Netter and Durand's,[75] Sainton's, Lafosse's,[18] and some others) there were 59 cases of synovitis, or 6·5 per cent. It is more often seen in adolescents and adults than in babies, thus recalling the incidence of synovitis in acute rheumatism; but when it does occur in babies the hands and feet are specially picked out, whereas in older patients the larger joints—the knees, wrists, and ankles—are usually attacked. In posterior basic meningitis Still[103] found peri-articular infection, the joint cavities being healthy, in 4 out of 49 cases examined after death, and Osler,[32] in his Cavendish lecture, said the lesions were generally peri-articular.

The joint tissues are little affected, and though suppurative synovitis with characteristic grass-green pus occurs, it must be rare; only one out of the 24 naval cases required aspiration, the affection being usually of short duration, as if a serous synovitis, though two cases lasted for six weeks and showed relapses. According to Netter and Durand the pus in the early cases shows meningococci, which may die out in the chronic cases. Horder refers to a case with meningococci and *Staphylococcus aureus* in the pus.

Clinical Features of Joint Lesions: Prognosis.

The accounts of the clinical features of the joint lesions in cerebro-spinal fever vary; thus, by some writers the joints are said to be very painful, by others as tolerant of movement. This is probably to some extent explained by adopting Herrick's[14] description of two groups of cases: (*a*) the early synovitis occurring in the septicæmic stage, and sometimes before the appearance of any meningitic symptoms; several joints are attacked, usually are very painful though but slightly swollen, show local heat, some redness or erythema of the skin, and even a rash. Sometimes the existence of these effusions is latent; thus, an effusion into the knee may be only discovered on trying Kernig's sign. The condition closely resembles that of acute rheumatism, and I have seen it accompanied by acute pericarditis. These cases of early synovitis are the commonest, and most of the 24 naval cases belonged to this category. (*b*) The late cases of arthritis which are monarticular, the knee usually being attacked, purulent, with much local swelling, little redness of the skin, relatively little pain, freedom from muscular spasm, and little limitation of movement, there being a remarkable contrast between the considerable degree of swelling and the slight functional impairment.

The prognosis as regards the condition of the joint is good: the early cases clear up rapidly and commonly without any necessity for the intra-articular injection of serum. Even suppurative cases may clear up after simple aspiration. Ankylosis, of which Roger records a case with implication of the hip and knee, is rare. Other cases have been reported by Netter and Josias,[79] and Sainton and Bouquet,[104] who report a case with arthritis of the shoulder, subsequently becoming ankylosed before the onset of meningitis and later suppurative arthritis of the knee after the meningitis. According to Netter[72] cases with articular lesions usually do well, with the exception that in infants the mortality is high; but, as pointed out elsewhere, the mortality in infants is usually high because the treatment is commonly begun so late. Among 24 naval cases there were six deaths, or 25 per cent., a lower rate than that (41 per cent.) among the 502 cases.

The chronic cases of meningococcic pyarthrosis may imitate gonococcic or tuberculous arthritis. When the synovitis occurs about the eighth day of the disease it may be difficult to decide whether it is meningococcic or the first sign of serum disease. For the treatment intra-articular injection of serum has been widely recommended, but most cases clear up with purely symptomatic treatment. Salicylates do not exert any influence on the synovitis, but aspirin relieves the pain.

URINARY CHANGES.

The urinary changes are not characteristic or of clinical importance.

Cystitis may occur, and the incidence of pyuria has varied in different outbreaks; Fairley and Stewart's percentage of 40 is much the highest I have come across. *Pyelitis* was reported in 5 per cent. of the Texas epidemic by Sophian, who described meningococci in the urine; but general experience shows that meningococci are rare in the urine, and that cystitis and pyuria during the disease may be due to other organisms; in this connexion it may be mentioned that the changes in the lymphatic tissue of the alimentary canal have been thought to favour hæmic infection of the urinary tract with *Bacillus coli*. *Polyuria* is occasionally noted; it is stated to be a critical phenomenon, but it may certainly occur while the temperature remains high.

Albuminuria is not very common, and when present is usually small in amount. Cazamian[13] is exceptional in finding it in all his 113 cases, but in many it was transient or in traces only. It is commonest early in grave cases, but otherwise it has no prognostic significance, and permanent renal change never follows. Albuminuria is rarely accompanied by casts, and is regarded by Cazamian as not renal, but due to changes in the medulla oblongata. Occasionally transient albuminuria occurs synchronously with œdema and urticaria—"serous hæmorrhages"—of serum disease.

Hæmaturia is not common; when it occurs it usually is an early complication, and is associated with a petechial or hæmorrhagic rash; it is presumably caused by hæmorrhages in the mucous membrane of the urinary tract, but is not so often seen in the fulminating cases with much purpura as might naturally be expected. Among the 502 naval cases it was noted in 4 only; in 3 of these it was associated with a petechial rash; in the other it was due to an acute ascending pyelitis. Among Neave's 73 cases two had hæmaturia. If the patient be taking hexamine this may be the explanation.

Glycosuria is rare and may be quite transient. Among Cazamian's 113 cases it occurred in 9, or 7·9 per cent., but acetone bodies were never present. There was one case only among Sophian's series. It may occur at the onset, and

when found in an unconscious patient has been thought to indicate diabetic coma. It may be associated with albuminuria; Flack [32] mentions a case of nephritis with blood and sugar in the urine, which recovered rapidly. In a naval case that recovered albuminuria, glycosuria, and acetone in the breath were noted on the second day of the disease. It is stated to be less frequent than in tuberculous meningitis, in which it occurs late; Garrod and Frew [36] found it in 15 out of 41 cases of tuberculous meningitis but never in posterior basic meningitis. The glycosuria would appear to be nervous and central in origin, but more than this it is difficult to say. It is not due to increased intracranial pressure or to hyperpituitarism which diminishes the sugar tolerance, for examination of the gland does not reveal any changes different from those in pneumonia, and some observations made by Fairley and Stewart showed that the behaviour of the sugar tolerance and of the blood pressure in cerebro-spinal fever do not lend any support to the view that peri-hypophyseal inflammation by causing increased vascularity induces increased functional activity of the gland.

Urobilinogenuria was recorded by Cazamian in three-quarters of his 113 cases; it was most intense at the onset and was as frequent in the non-septicæmic as in the septicæmic cases. *Indicanuria* is stated to occur in grave cases (Netter and Debré), but was detected by Cazamian in two only out of his 25 fatal cases.

EPIDIDYMITIS AND ORCHITIS.

Epididymitis or orchitis are complications of cerebro-spinal fever, and the meningococcus has been obtained by puncture of the inflamed organ (Florand and Fiessinger [44]), but the text-books rarely mention the lesion. Like other complications, the incidence varies; it is said to have been specially frequent in the Silesian epidemic; among the 290 cases at Camp Jackson in 1918 it occurred in 3 per cent., but in a sporadic outbreak of 36 cases at the same camp in October, 1918, more than a third had epididymitis (Latham [60]). Among 502 naval cases it was noted in 13, or 2·6 per cent.; among Herrick's [45] 208 cases at Camp Jackson in 9, or 4·3 per cent.; among Sainton's [96] 64 cases in 3, or 4·7 per cent.; and among McConnell, Morris, and Seehorn's [64] 30 cases in 2, or 6·7 per cent. In all these cases (36, or 3·9 per cent., out of 922) the possibility of gonococcic origin was, of course, excluded.

It appears that both meningococci (Gordon's Types I. and III.) and para-meningococci (Gordon's Types II. and IV.) may be associated with orchitis and epididymitis; but it is interesting that Latham's cases were associated with Type IV., which seems particularly prone to cause septicæmic and metastatic lesions, and is said to be the closest to the gonococcus biologically and culturally. Eschbach and Lacaze's [27] two cases of simultaneous synovitis and epididymitis recall the morphological resemblance between the meningococcus and the gonococcus.

A curious sequence of events is recorded by Beaussart [9] in a man who had cerebro-spinal fever with double orchi-epididymitis in 1917, and in the following year had influenza with a recurrence starting in the testis and spreading to the epididymis.

In some instances puncture of the inflamed organ has failed to give meningococci, and Latham, whose cases all received massive intravenous injections of serum, found that epididymitis was not a sequel of serum injections in pneumonia; in some of the naval cases the onset coincided with a serum rash. These data raise but do not settle the question whether some of the cases may be infective, others toxic or anaphylactic. In Latham's cases 70 per cent. had given a positive blood culture, and though none of them had a relapse after the appearance of the epididymitis he inclines to the view that the lesion is septicæmic.

The recorded descriptions refer both to epididymitis and orchitis, and some authors have recorded cases in which the epididymis and body of the testis were affected successively (Florand and Fiessinger, Sainton). In Latham's cases the epididymis alone was inflamed, in McConnell, Morris, and Seehorn's 2 cases the testis exclusively. Probably the epididymis is more often attacked. There does not appear to be any good reason to believe that orchitis and epididymitis are due to different mechanisms; it might be thought that epididymitis is due to an ascending infection from the bladder, late in the course of the disease; but evidence of meningococci in the urine in such cases is very scanty; thus in three cases of epididymitis on the 46th, 23rd, and 15th days of the disease, recorded by Lancelin, [70] the meningococcus was found in the urine in one only.

As already mentioned, it is generally considered that the epididymitis and orchitis are septicæmic in origin, and it might be thought that this applies particularly to orchitis, and that the incidence would usually be early in the disease. In six cases of orchitis in the Navy the complication, which was bilateral in three cases, appeared on the sixth, eighth, tenth, eleventh, and twelfth days of the disease. In a case of Florand and Fiessinger the right testis became inflamed on the thirteenth day and the epididymis the next day. It is possible that epididymitis or orchitis may, like meningococcic arthritis, precede the onset of meningitis. This is suggested by the history of a private in the Marines who had pain in one epididymis without any evidence of gonorrhœa for three days, and three days later had meningitic symptoms and died four days later from the disease. I have not any reference to cases in boys under the age of puberty.

There may be orchitis alone or epididymitis only, or one may precede the other; in about 10 per cent. of the cases the lesion is bilateral. Epididymitis begins in the globus major, and subsequently there may be some effusion into the tunica vaginalis. Orchitis or epididymitis is almost always transient, subsiding without suppuration and not being followed by atrophy. Pick, [83] however, recorded suppuration in both vesiculæ seminales due to the meningococcus. There is not any relation between the incidence of epididymitis and orchitis on the one hand, and the clinical severity of the cases on the other hand.

RELAPSES AND RECRUDESCENCES.

There is some confusion between these two terms and therefore some uncertainty about the frequency of true relapses.

Recrudescences, sometimes called intermittent relapses, or the return of symptoms before the patient has really recovered from the disease, are very common and a patient may have several; among the naval cases one patient had 7, and Ker quotes 13 recrudescences. They may be due to reinfection from the throat or from some focus untouched by the intrathecal injections of serum, but what often appear to be recrudescences are really manifestations of encysted meningitis or infection of the cerebral ventricles, the foramina of which are obstructed.

True relapses are rare. Netter [73] appears to draw the line between recrudescences and relapses at a month from the disappearance of symptoms, and reported 4, or 1·6 per cent., among 255 cases. Herrick observed two relapses four and three weeks respectively after convalescence among 208 cases. Sophian, however, estimated that relapses after complete recovery from the original attack occurred in 5 per cent. of his cases. Relapses are, like recrudescences, due to reinfection; in isolated instances they have followed anti-typhoid inoculation (Sainton, [90] Massary and Tockmann [57]) or an attack of enteric fever (Labbé [77]) or measles (Netter). The introduction of serum treatment was at first followed by an increased incidence of relapses, but this is ascribed to failures in the application of the serum treatment. In most cases of a true relapse the symptoms are similar to but milder than in the original attack.

Late relapses at long intervals after the patient has been cured can hardly be distinguished from second attacks. These cases of second attack are very rare; it is noteworthy that one attack of meningococcic infection usually protects against another, and that, as Adami [1] has pointed out, the meningococcus thus differs from the majority of pathogenic micrococci. Councilman, Mallory, and Wright, and more recently Netter, have reviewed the literature on the subject, and refer to North's two cases at 25 and 21 months' interval, Hermann and Kober's at a year's interval, and Warschauner at five years' interval. A naval rating had bacteriologically proved meningococcic meningitis both in May, 1917, and in February, 1918, and on the occasion of the second attack after 23 days' normal temperature had a relapse with eventual recovery.

DIAGNOSIS.

Bacteriological Examination.

For the certain diagnosis of meningococcic meningitis bacteriological examination of the cerebro-spinal fluid for meningococci is necessary, and similarly in the premeningitic stage of cerebro-spinal fever a blood culture is essential. No

doubt genuine cases of cerebro-spinal fever may be ruled out by failure of bacteriological methods to give positive results. But this error is probably much less than that which would result from the inclusion of cases diagnosed on clinical grounds, and in the latter event it would be difficult to know where to draw the line.

Cases with meningitic symptoms and meningococci in the naso-pharynx but not in the cerebro-spinal fluid, though often probably genuine cases, and, indeed, so regarded by Flack,[33] are open to the criticism that they may be meningococcic carriers with meningitis or meningism due to some other cause. Flack's ground for his view was that the meningococcus isolated from the naso-pharynx in three cases in which it could not be grown from the cerebro-spinal fluid was agglutinated by the patient's blood, whereas the other types of meningococci were not. But since then Gates[37] has shown that the blood serum of chronic carriers contains specific agglutinins.

No clinical manifestation is pathognomonic of meningococcic infection. In the presence of an epidemic an acute onset with fever, vomiting, severe headache, and malaise may well arouse suspicion, but a similar train of symptoms may occur in many toxæmic conditions, and together with cerebral symptoms (meningism) may accompany acute infections such as influenza, pneumonia, enteric fever, otitis, malaria. A hæmorrhagic rash, though highly suggestive of meningococcæmia, may be present in pneumococcic, streptococcic, and influenzal infections, and in malignant forms of the exanthemata such as small-pox. From other forms of meningitis, such as tuberculous, pneumococcic, otitic, influenzal, an undoubted diagnosis can be made only by lumbar puncture and examination of the cerebro-spinal fluid.

Lumbar Puncture.

As lumbar puncture is such an essential element in the diagnosis, it is well to insist that the risk of any harm from diagnostic puncture, provided the fluid is not withdrawn too rapidly or in excessive quantities, is almost negligible; some hæmorrhage may occur, but this seldom causes serious damage. In one instance, however, in a case of tuberculous meningitis, lumbar puncture was followed by a bullous eruption on one foot, and after death a clot of blood was found inside the theca vertebralis and in contact with the posterior nerve roots.[93] The cauda equina may be injured and severe pain in the lower limbs thus caused, and I have heard of a case of traumatic aneurysm of a small artery on the posterior surface of the cauda equina as the result of lumbar puncture. In a few instances pain and wasting have followed in a lower limb, suggesting damage to the lumbo-sacral plexus, and it must be admitted that signs of caudal myelitis and even widespread suppuration around the vertebræ may supervene in cases in which lumbar punctures have been frequently performed.

The risk of introducing infection and setting up meningitis by diagnostic puncture may be practically dismissed, and is quite different from the danger of infection from repeated tappings. Recent experiments by Weed, Wegeforth, Ayer, and Felton[108] show that after intravenous injection of micro-organisms withdrawal of the cerebro-spinal fluid induces meningitis; but lumbar puncture is so frequently performed in conditions in which micro-organisms are or may be present in the blood stream, such as pneumococcic and influenzal infections, and clear fluid is drawn off without the subsequent occurrence of meningitis that in practice there is no risk that lumbar puncture alone will, by reducing the local resistance of the meninges, lead to their infection. Lumbar puncture alone thus differs from lumbar puncture followed by the intrathecal injection of horse serum, a procedure which first sets up an aseptic polymorphonuclear meningitis and then allows micro-organisms in the blood stream to invade the meninges.

Cases in which Diagnosis Remains in Doubt.

Although it is simple enough to depend for the diagnosis of meningococcic meningitis on the examination of the cerebro-spinal fluid for meningococci, there are a number of cases in which a decision is still left in doubt. Cases certainly occur about which the purely clinical diagnosis appears unquestionable, but in which the cerebro-spinal fluid, though turbid from the presence of polymorphonuclear leucocytes, does not contain any micro-organisms; thus, among 121 cerebro-spinal fluids from cases of meningitis in the French Army, Sacquépée, Burnet, and Weissenbach[97] found 6 with the features of Widal's puriform aseptic meningitis, in which no micro-organisms could be found by direct examination or by cultivation; and Adshead,[2] in an analysis of 71 cases of cerebro-spinal fever, includes 4 with purulent aseptic cerebro-spinal fluid.

No significance, of course, can be attached to cases with a clear fluid at the first tapping and a sterile turbid fluid after a subsequent intrathecal injection of serum. The occurrence of cases with a sterile polymorphonuclear fluid at the first lumbar puncture recalls Hort's[48] contention that the meningococcus is only one of the phases in the life-cycle of the virus, and raises the unorthodox suggestion that in some of the phases the organism may be a filter-passer.

These cases should be treated, although they cannot be tabulated, as meningococcic; recovery is in favour of a meningococcic origin, not only from the point of view of this therapeutic test, but also because other forms of polymorphonuclear meningitis are usually fatal, recoveries in pneumococcic meningitis being most exceptional.

Differential Diagnosis.

As already mentioned, the cerebro-spinal fluid, though characteristically polymorphonuclear, may, particularly in chronic cases, show a predominance of lymphocytes, and so resemble the cytology of the meningitis of tuberculosis, syphilis, mumps, malaria, acute lead poisoning, and of the meningitic form of acute poliomyelitis. Incidentally, some of the clinical differences from tuberculous meningitis have been referred to, and with regard to the others, though it is an interesting academic study, lumbar puncture will always be necessary and more rapidly and surely decide the diagnosis and prognosis.

Meningism may be due to such a large number of acute infections that it would take too long to detail them. *Pneumonia*, especially in children and in apical pneumonia in adults, may be ushered in by signs of meningeal irritation, and the absence of meningitis can only be certainly and at once settled by examination of the cerebro-spinal fluid, for, on the one hand, there may be pneumococcic meningitis, or, on the other hand, even if a patient have physical signs of pneumonia, there may also be meningococcic meningitis, as was shown by isolated cases in the Navy and by Jacobitz's[53] record of three cases of meningococcic meningitis with meningococcic pneumonia. Much the same is true of *otitis media*, which may cause meningism, or, as in five naval cases, may be followed by meningococcic meningitis.

As the onset of the two diseases may be exactly similar, both being somewhat protean in this respect, the diagnosis between cerebro-spinal fever and *influenza* with meningism can often only be made by lumbar puncture. It is especially during outbreaks, such as in the late autumn of 1918, that sporadic cases of cerebro-spinal fever are prone to be overlooked until the symptoms become unmistakable. Among a number of influenzal cases the occurrence of a case with headache more severe than usual and not yielding to treatment, stiffness of the neck, and Kernig's sign should suggest lumbar puncture.

The meningism of acute *malaria*, especially as herpes labialis is common, may suggest cerebro-spinal fever; the presence of parasites in the blood, the lymphocytosis of the cerebro-spinal fluid, and the rapid disappearance of the symptoms after injections of quinine should enable a correct diagnosis to be made. The cases of chronic meningococcic septicæmia may imitate malaria but do not react to quinine, and should be recognised by a blood culture.

After salvarsan injection meningism has in rare instances been known to occur (Sabrazes[86]). In exceptional cases prophylactic vaccination against cerebro-spinal fever has caused symptoms of meningeal irritation and simulated the onset of the disease, but the disturbance is not progressive, and even when most marked passes off in a few hours (Gates).

Tonsillitis with enlarged cervical glands by causing stiffness of the neck may, when cerebro-spinal fever is epidemic, be regarded as the more serious disease. *Rheumatic* stiffness of the neck is ameliorated by movement, whereas that of cerebro-spinal fever is aggravated and in an early stage may only be brought out by repeated movements. On account of the headache, stiffness of the neck, and the rash, *measles* and *rubella* have sometimes been thought to be meningitis. *Rheumatic fever* may be simulated by cases of

cerebro-spinal fever with an acute arthritic onset, but the failure of salicylates to reduce fever and pain should render this diagnosis doubtful.

Spirochætosis ictero-hæmorrhagica may cause meningitis, and in some of these cases there may be little or no jaundice (Costa and Troisier [40]). The detection of the spirochæte in the urine and of its pathogenic effect by injection of the patient's blood and urine into guinea-pigs will establish the diagnosis.

In the *acute infective polyneuritis* described by Bradford, Bashford, and Wilson,[14] the initial symptoms of headache, vomiting, pain in the back, and moderate fever are in rare instances sufficiently severe to suggest the possibility of cerebro-spinal fever, but lumbar puncture shows that there is not any meningitis. *Anthrax* with cerebral symptoms may imitate meningococcic meningitis. In five cases of rapidly fatal anthrax recorded by Reece [87] there were cerebral symptoms and anthrax bacilli in the cerebro-spinal fluid, but the symptoms were characteristic of cerebro-spinal fever in two only. During the same year, 1917, there were two cases of anthrax imitating cerebro-spinal fever in the Navy.[107] *Meningeal hæmorrhage* from various cause may closely imitate the early stages of meningococcic meningitis, and for a correct diagnosis examination of the cerebrospinal fluid is then essential.

The meningitic form of acute poliomyelitis.—Clinically the resemblance to cerebro-spinal fever is very close; thus in 1911 Reece [86] found that a reputed outbreak of cerebro-spinal fever was really one of acute poliomyelitis without any admixture of meningococcic cases. Sporadic cases of meningococcic infection occurring in the summer, the favourite period of the year for poliomyelitis, and in the presence of the other disease are naturally liable to be misinterpreted; if recovery occur a residual paralysis suggests that the disease was really acute poliomyelitis. In July, 1915, there was an outbreak of 15 cases clinically resembling cerebro-spinal fever among the youths at Shotley Barracks, but only four were proved bacteriologically to be of this nature; consideration of the notes justified the suspicion that one might have been a case of poliomyelitis. As already mentioned, the diagnosis depends on examination of the cerebro-spinal fluid, which shows a lymphocytosis and absence of meningococci.

Encephalitis lethargica, when first seen in Paris and elsewhere, was thought to be meningococcic meningitis until lumbar puncture put this diagnosis out of court.[75] The cerebro-spinal fluid is clear and the cell content usually normal; if there be any cytological change it is in the direction of a lymphocytosis. Another difference from meningococcic infection is the absence of a hæmic leucocytosis (Panton [83]). The striking features of the disease—lethargy and ocular paralyses, though the latter are not constant—should arouse suspicion. On the other hand, the patients may have erythematous or petechial rashes, herpes, swelling of the joints, and vomiting. When first seen some cases of meningococcic meningitis may suggest ordinary *epilepsy*, *tetanus*, or even *strychnine poisoning*; this is especially likely to occur in sporadic cases or at the commencement of an outbreak.

Uræmia may be suggested by fulminating cases in an unconscious condition, especially as there may be albuminuria, or from collapse, suppression of urine (Robertson [93]), and a petechial rash which might be thought to be uræmic. In pregnant women convulsions during cerebro-spinal fever have been regarded as eclamptic (Williamson [113]). In a case reported by Roberts and Ford,[91] pain and loss of power in the legs, puffiness of the face, and albuminuria were thought to be due to acute nephritis and uræmia. In fulminating cerebro-spinal fever the blood pressure is low and the extensor plantar response, obtained in uræmia, is rare.

The purpuric eruption of the fulminating and acute cases may lead to confusion with fulminating and other forms of *purpura*, such as acute lymphocytic leukæmia, streptococcic septicæmia, Henoch's purpura, and the diagnosis may be cleared up only after death (Verbizier,[106] Pape and Laroche [84]). *Hæmorrhagic small-pox* occurring in connexion with cerebro-spinal fever may be regarded as the meningococcic infection. Sir William Osler tells me that hæmorrhagic cerebro-spinal fever was recognised in Montreal in 1872, and that two years later a case of hæmorrhagic small-pox was regarded as cerebro-spinal fever until the patient's mother went sick with small-pox. In the past the disease appears to have been confused with *malignant measles*, for in 1867 Gordon [40] stated that hæmorrhagic measles always accompanied cerebro-spinal fever. The mottled rash may suggest measles, and in a case of meningococcæmia without meningitis, as in that recorded by Sainton and Maille,[100] a blood culture may be necessary to clinch the diagnosis. In *typhus* the purpuric rash does not appear before the fourth day of the disease, whereas it is an initial sign in cerebro-spinal fever. The fulminating cases may at first simulate severe *food poisoning*.

In acute *osteomyelitis of the spine* lumbar puncture may give exit to pus from the extradural space. This occurred in two cases in the Royal Navy. In neither of these were there definite symptoms of cerebro-spinal fever, but Grisel,[41] in a review of this form of osteomyelitis, states that although in some cases the symptoms of compression are quite definite and disappear when the abscess is evacuated, there are others in which the association with meningitic symptoms and septicæmia renders the diagnosis very difficult.

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(Continued at foot of next page.)

SANITARY AND INSANITARY MAKESHIFTS IN THE EASTERN WAR AREAS.[1]

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NECESSITY is the mother of invention, and war may well be termed the father of necessity, for certain it is that in war man is time and again in dire need. He has to make use of whatever material he can lay hands on. He has to set his wits to work to devise expedients. He has to invent and improvise on the spur of the moment to meet exceptional circumstances, and it must be admitted that his ingenuity is remarkable. If this is true of the combatant, as witness the tanks and hundreds of other marvellous devices, it is equally true, though on a more modest scale, of the sanitarian.

It has occurred to me that it may be of interest to consider some of the makeshifts of the army hygienist in hot climates. I have been privileged to visit all the important tropical and subtropical theatres of war, sometimes I fear as a kind of stormy petrel, and, thanks to Mr. Wellcome—who placed the resources of his Bureau wholly at the disposal of the War Office—I have been able to secure a large number of instructive photographs which will serve as the text of a sanitary sermon. I may say that I was a member of the Medical Advisory Committee which visited Egypt, Mudros, Gallipoli, Salonika, Malta, and Mesopotamia. I then accompanied Major-General Pike, C.M.G., D.S.O., A.M.S., to East and South Africa. Finally, at the invitation of General Allenby, I went to Palestine to see the anti-mosquito operations there.

Like a sermon, the address is divided into heads for, contrary to the usual army view (I am not referring to the army *medical* view), sanitation is a very large subject, and I have no hesitation in saying it is, or should be, the most important branch of medical work in the field. The term "medical," as here used, does not include surgery. It is a trite saying that prevention is better than cure. Everybody knows it, everybody seems to agree with it, but only a minority practise it, and that is why hygiene is, as I have heard it called, the Cinderella of the Medical Services.

Now in army parlance sanitation is still most unfortunately almost a synonym for latrines. It looks as if it would take half a century yet to drive this idea out of the minds of a generation which, thanks to faulty initial education, scarcely yet know how they live, move, and have their being. It is a sad business, for it spells human lives and untold misery and grief and wretchedness; little crosses in lonely places, wrecked homes and a vast burden of expense and inefficiency. Still there seems some prospect of better things, and one looks forward to the day when the sanitary flag will alter its hue and sport a mingled blue and white, the white of purity, the blue of hope.

[Sewage collection and disposal was first dealt with in detail. Various forms of latrines were considered, incinerators, and septic tanks. The next subject under review was:—]

Food and Cooking.

I suppose it seems heresy to say so, but I am convinced that the excellent health of the troops on the Western front is quite as much due to the indefatigable efforts of the Royal Army Service Corps as to those of the Royal Army Medical Corps, speaking for the moment merely as regards the question of transport and distribution of food. I am sure that many officers of the Medical Corps will agree with me. It stands to reason. Feed a man well—that is, give him plenty of good food in sufficient variety, adapted to his racial peculiarities, to the climatic conditions under which he is serving, and well cooked, and in the great majority of cases he will defy not only the Boche but the bacillus. I am certain also that, anti-mosquito precautions and preventive inoculation excepted, good food and proper cooking are more important sanitary measures than any others in the field. Where were they not forthcoming? In Gallipoli, Mesopotamia, and East Africa. What war areas have had the greatest disease incidence, the highest mortality? Gallipoli, East Africa, and Mesopotamia.

To this day it is not fully realised that questions of food and cooking are scientific questions—that the advice of dietetic experts should invariably be sought and followed. If this were done, one would not see ration scales for native African troops devoid of substances essential to life and health—one dietary without sugar, another minus vegetables. It seems scarcely credible, but it is true.

Now cookhouses are important places. In the earlier stages of the war everyone tried to make cookhouses flyproof, with the result of converting them into flytraps. Anyone who was at Mudros will confirm this statement. It is no use employing wire netting in a cookhouse unless you have double doors, can execute instant repairs, and can post a sentry to shoot those who put stones under the doors to keep them open. No, a cookhouse must be well ventilated, as dark as possible, and its door should face north in the northern hemisphere and south if it is on the other side of the equator. All this sounds trivial, but at Lindi, in East Africa I saw a cookhouse on which many pounds had been spent, and it was worse than useless. On the other hand, I saw a fenestrated mud-brick cookhouse, of most excellent design, near Jaffa. It is a new and original pattern, well worthy of adoption, the invention of Lieutenant-Colonel A. L. Otway, R.A.M.C.

Much ingenuity is often displayed in the construction of open-air kitchens and field ovens. The same is true of field bakeries—most important institutions in which very often wonderfully good bread is baked. Believe me, good bread often means good health, for, as you know, bread is the "staff of life."

I direct attention to the plan of an underground larder used by a crack cavalry regiment in Mesopotamia. (Fig. 1.) While their comrades spoiled their teeth and their tempers on tough meat, this unit enjoyed tender roasts and stews throughout the fiery heat of a Mesopotamian summer—a fitting reward of enterprise.

Professor W. J. R. Simpson, at the last meeting of the Society, paid a tribute to our gallant allies, the Serbians. I saw a good deal of these fine peasant soldiers just after they reached Salonika from Corfu. We had a great deal to learn from such veteran campaigners. While our men too often "pigged it" in their tents—many units at that time having no mess marquees or huts—the Serbians dined in comfort at stone tables under an awning of tree branches, which they collected from a place eight miles away. They had dining-tables and serving-tables made of stone, and also officers' dining-table and seats of wicker- or basket-work, both comfortable and picturesque.

Water-Supplies.

Lack of space prevents any reference to the hundred and one contrivances for dealing with sullage water in hot countries. Of more importance is the question of water-supplies and of water purification. The sources of supply varied greatly on various fronts. Egyptian filtered water, brought by tank steamers, was the chief supply in Gallipoli;

[1] A paper read before the Society of Tropical Medicine and Hygiene and illustrated by numerous photographs, the copyright property of the Wellcome Bureau of Scientific Research.

(Continued from preceding page.)

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in Salonika, mountain streams were often a source; in Palestine, the sources varied from the beautiful "Springs of the Sultan," near Jericho, to the clear waters of the rapid Auja river, which flows into the sea near Jaffa, and included the new reservoir supply for Jerusalem, gathered from the hills about Bethlehem. In Egypt, the Nile and its canals furnished the supply and brought risks of bilharzia; in Mesopotamia, a dry and thirsty land, the Shatt-el-Arab, the Tigris, the Euphrates, the Karun, and surface wells yielded their waters, sometimes with the cholera vibrio in them; in East Africa, men drank from rivers and from water-holes, from mountain streams and from wells, and ran many risks in consequence, for the makeshifts devised for protection were too often well worthy of the name.

Let us look at some of them and at methods of collecting, transporting, storing, and purifying water on various fronts. Putting a strand or two of barbed wire round a water-hole and placing a native sentry on guard over it are measures of slight utility, though better than nothing. Where possible, a high fence should surround the spring or pool, with a hole in it through which the collecting hose passes. This was

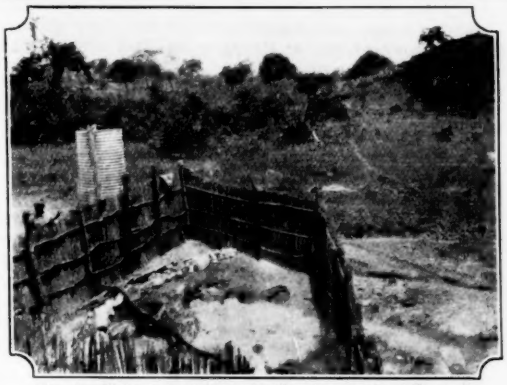

FIG. 2.—Well-protected "spring" water-supply at Summit, East Africa, showing hose leading to water-tank.

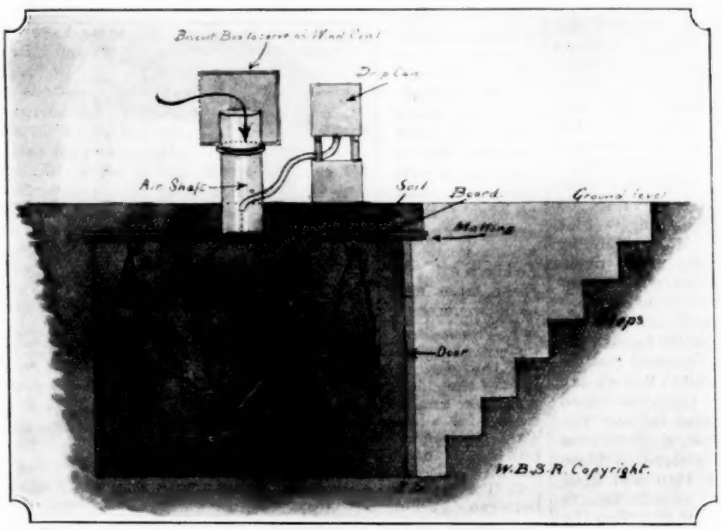

FIG. 1.—Method of keeping meat and ensuring that it was tender, employed by a cavalry regiment in Mesopotamia.

done at Summit, on the Mikese-Rufiji road, in East Africa, and answered excellently. (Fig. 2.) At Amara, in Mesopotamia, the admirably protected well areas with covered wells were one of the sanitary features of the place, and a tribute to the Royal Engineers.

The only special device for collection which I will mention is the use of the huge fruits of the baobab tree as pitchers when drawing water from wells. Methods of pumping, more or less elaborate, are shown on the screen.

Storage is often a troublesome business, especially in a country like Mesopotamia, where for a long time transport was a great difficulty. That is one reason why large rubber canvas troughs, each holding 2300 gallons, came into use. (Fig. 3.) Their only drawback was that they were not covered. Tanks hollowed out in the soil, lined by tarpaulin and covered with canvas, were common in the Advanced Corps Area in 1916. I have seen drinking water stored in a German shell-case, which makes an excellent receptacle. Unfortunately, someone had placed the long metal cylinder in the blazing sun and the water was scarcely refreshing. Even makeshifts must be properly used. A very bad type of watertrough was the canvas diggie made in Basra—a clumsy, heavy, leaking arrangement.

Water was transported in many ways: by carts, in pakhals and fantasses, on mules and camels, in bags, in petrol-tins as at Anzac—a weary business, but I do not recall any very novel devices, save the use of iron telegraph poles as pipes at Sheikh Saad in Mesopotamia, and of split date-palm trunks as water-gutters.

Purification of Water.

In some places I have seen river water boiled in petrol-tins on the bank, and all the good of the boiling vitiated by the transport people plugging the openings in the tins with bunches of grass or reeds—a very insanitary makeshift. On the other hand, an Indian hospital had an admirable arrangement whereby water was sterilised in special boilers and gravitated by tin channels to metal receptacles. At Port Amelia, in Portuguese territory, a British hospital adopted the principle, but placed the receptacles uphill from the boilers, and so the boiled water had to be carried up to them by hand, an element of risk being thereby introduced. As has been truly said, common sense is rare sense.

Two makeshifts for preparing good emulsions of chlorinated lime are worth noting, both employed in Basra. The earlier one consisted in Indians violently shaking Winchester quarts filled with the solution; the latter was represented by ingenious hand-churns, and worked very well. (Fig. 4.)

Elaborate improvised labyrinths were at one time in vogue in the Suez Canal zone to ensure a thorough mixing of water with alum, and thereby a satisfactory precipitation prior to filtration.

FIG. 3.—Rubber canvas for holding drinking water. These canvas tanks hold 2300 gallons.

The design reminded one of the maze at Hampton Court. A sergeant-major at Amara effectually prevented thirsty souls from drinking out of a tin dipper, and thereby possibly contaminating a water-supply, by serrating the edge of the tin; while a good method of cooling water employed in Macedonia was to surround a water-tank with sandbags, which were kept wet, an air space being left between the bags and the tank.

Bathing and Washing.

Great ingenuity was often shown in the construction of shower-baths, but nowhere more so than in the Corps area

in Mesopotamia, where the absence of wood and stone resulted in certain remarkable tin structures. The simplest makeshift, however, was at Morogoro, in East Africa, where by hollowing out the ground a stream was made to cascade and thereby supply a splendid douche. The damming up of natural watercourses often resulted in the provision of excellent baths (Fig. 5), and a fine swimming-pool was created by the use of a huge metal tank employed in the soda works at Wady Natrun in the western Egyptian desert. The ordinary ablution bench was very unsatisfactory until one genius thought of adding a rail, on which coats and shirts could be hung. Previously, these garments, like "Uncle Pete's hat," had been hung on the ground, and were very apt to get dirty and wet. Talking of cleaning, the plan of scrubbing steamers' decks on the Victoria Nyanza with half cocoa-nut shells came as a revelation to me, and is probably new to most.

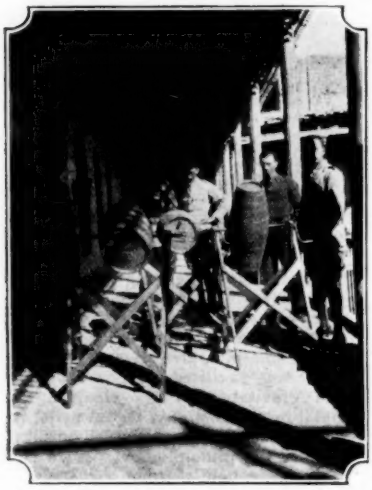

FIG. 4.—New method of preparing chlorinated lime solution for water sterilisation by use of churn.

Disinfection is closely allied to bathing and includes the destruction of vermin. The simplest makeshift for dealing with clothes lice is probably the oldest—the picking method—carried out either by the sufferer or a friend. But we can do better than this in the army, and the methods varied from the Serbian barrel to the most useful railway van disinfector, which of all devices I have seen accomplishes most in the shortest time, as can be seen in Colonel William Hunter's articles in THE LANCET for Sept. 14th and 21st, 1918. Both these useful methods owe their introduction to Lieutenant-Colonel G. E. F. Stammers, R.A.M.C. Now the Serbian barrel is often wrongly used. What is the use of placing it on a hillock and having to climb up to it every time soldiers' kits have to be popped into it? Again, why do so many people neglect to see that the water-tank, the source of steam, is so placed below the barrel that the largest available evaporating surface is provided? Success in sanitation depends largely on attention to detail, and very often this is not forthcoming. The so-called Levisseuse apparatus, which is a kind of metal Serbian barrel, has such a limited holding capacity that it is not much use.

FIG. 5.—Improvised bathing place, Macedonia, formed by damming up the course of a mountain stream.

A barrel may be used for holding disinfectant outside a latrine. It should be accompanied by a nail-brush fastened to a wire. One medical officer actually arranged a latrine in such a way that once in it a man could not emerge without dipping his hands in a disinfectant solution which effectually camouflaged the latch of the door. I fear the plan was more ingenious than effective.

A very insanitary makeshift for getting rid of dead animals on the road was too often in vogue in East Africa—namely, leaving them there till the flies and the vultures made an end of them. I saw a carcase where, it is true, an effort at charring had been made, but in which the main disinfection was that whereby Herod Agrippa ceased to be a nuisance, for this dead horse was being "eaten up of worms," or rather by the maggots of Pycnosoma flies.

Fly Destruction.

I do not like to call any invention of my own a makeshift, but would like to direct attention to the open-air cage fly-trap (Fig. 6), and to its modification by Captain F. Rose. Both these models work well when properly baited and operated. This is not the case when medical officers construct them so as to catch sparrows as well as flies, or alter them according to views which effectively ruin their efficiency, or pay no attention to them after the first excitement of trapping several thousand flies is over. Here are the rules which must be followed if these traps are to be a success:

FIG. 6.—Latest type of cage fly-trap, in use at Basra.

1. The calico or canvas forming the greater part of the sides of the trap should be stretched *tightly* on the framework.
2. The slit between the wire mesh and the alighting board should be just large enough to allow a bluebottle fly to enter the trap.
3. The trap should, as a rule, be placed in the sun out in the open.
4. It should be placed outside a mess or cookhouse, or near a latrine, or between an occupied tent or camp and any source of flies.
5. It is essential that it should be properly looked after, especially as regards baiting.
6. For this purpose it is best placed under the charge of some one person who will be responsible for keeping it in repair, baiting it properly, and cleaning it.
7. Any attractive bait may be employed, but one of the very best is chicken entrails. Human fæces may be used if placed in a tin carefully covered with wire gauze, so that the flies cannot get access to the contents. Other baits are: raw meat, cheese paste, stale beer, bread soaked in vinegar water, jam, marmalade, lentil paste with a little sugar sprinkled on it, old melon rinds, fruit and fish refuse.
8. Flies in the trap are best killed by having a poison solution such as formalin 3 per cent., made up with lime water, arsenite of soda syrup, or sodium fluoride. Whatever poison is used it is best placed in a covered tin through the lid of which wicks protrude. These wicks dip down into the fluid or syrup which they suck up, and the flies imbibing the poison from them speedily die.
9. Failing poison, the flies can be killed by spraying with spray oil or some similar preparation or by fumigation, the trap being covered over with cloths or blankets during the fumigating process.
10. A record should be kept of the daily catch; this may be done by weighing the flies or seeing how many will go into a receptacle of known capacity. A pint measure holds about 10,000.

It is perhaps news to many that a tangle-foot fly-paper is much more efficient if used in the form of on arch. (Fig. 7.)

This has probably something to do with the way the light falls upon it, and an apparatus has been devised for holding such curved papers. The roller-towel method of using arsenite of soda solution is an excellent makeshift arrangement, and with a minimum of attention ensures a constantly damp, poisoned surface for the delectation of our enemy the fly. (Fig. 8.)

At Nasiriyeh, on the Euphrates, Major W. S. Patton, I.M.S., has introduced Roubaud's method for destroying fly eggs and larvæ in horse manure. The heat of the manure is used as a

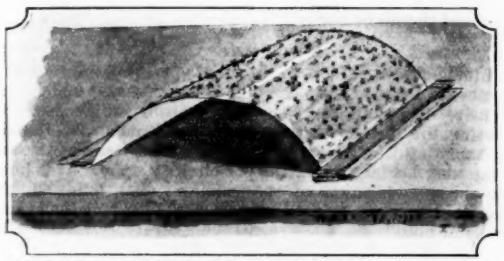

FIG. 7.—This arched form of fly-paper is found to serve as a more efficient trap.

lethal agent. Another device, which served to free a large hospital at Potchefstroon altogether of flies, was introduced by Lieutenant E. Baber, S.A.M.C., and has been described in THE LANCET for March 30th, 1918. Here the larvæ migrating from the heap were trapped in gullies and destroyed, and any flies which happened to breed out found leafy branches soaked in arsenite solution conveniently placed for their refreshment and rest, the latter of the eternal variety.

Buildings.

Lastly, a few words as to buildings. By far the most ingenious makeshift hospital ward I ever saw was the fenestrated mud-brick erection constructed by Lieutenant-Colonel Otway, R.A.M.C., of the 130th Combined Field Ambulance, on the road running north from Jaffa. Thanks to the use of mosquito mesh on the inner side of the fenestrations, and also over the doors and windows, this ward was absolutely free from flies and mosquitoes. It was partly hollowed out of the ground, but the portions left as bedsteads were of such a height that the patients lying on them could look out of the ward and see all that was passing. There was plenty of light and yet it was refreshingly cool. As I say, I never saw anything like it, and it deserves very honourable mention.

FIG. 8.—The trough in which the sacking dips contains the poisoned solution.

Some of the thatched bandas used as wards in the carrier hospitals in East Africa were truly works of art. Those in No. 1 Carrier Clearing Hospital at Iringa were really beautiful buildings and most comfortable, reflecting the greatest credit on Major Roberts, R.A.M.C., and his experienced architect, Staff-Sergeant Eales, S.A.M.C.

A trellised grape vine in a monastery close to the Jordan formed quite a good makeshift ward for the patients in an Indian Cavalry Field Ambulance, while I would direct attention to the curious little shelters for cerebro-spinal contacts employed at Dodoma in East Africa.

A method of warming a tent by a stove and chimney was in use on the Karun Front in Mesopotamia; and at Amara the remarkable huts of the British Convalescent Depôt dug out of the soil, roofed with reeds and provided with lateral ventilating shafts, were admired by all who saw them, and used by as many as could get into them.

Finally, I may remark that no one who was ever inside the famous sandbag bacteriological laboratory, tucked away out of shell-fire at the base of the cliffs at Cape Helles, is likely to forget it, and that the remembrance of the huge packing case which had once held an aeroplane doing duty at Dar-es-Salaam as a hospital laboratory is not likely to fade.

The Claims of Sanitation.

I think I have said enough to prove that the army sanitarian has plenty of ingenuity, even if it is at times wrongly applied. Believe me, he has need of it, for he is often left in the lurch. Why is this the case? There are several reasons, but one is that the sanitarian has to go cap in hand to the Ordnance Department or the Royal Engineers and beg for material. Sometimes he will get it at once, sometimes after a long time, very often not at all. Let me tell you a true story which speaks for itself:—

A New Zealand medical unit on a certain island was badly in need of wood for sanitary purposes. Requisition after requisition failed. Finally, the Commanding Officer said to his Quartermaster, "I want you to indent on the Ordnance for a large supply of wood to make tombstones."

"Tombstones!" said the Quartermaster, "what do we want with tombstones?"

"Never you mind," was the reply, "do as I tell you."

Next day a cart, laden with wood of all shapes and sizes, made its appearance. There was plenty for the dead. There was none for the living.

Naturally enough the Engineers, a very busy and capable corps, scarcely realise the paramount claims of sanitation. Like Martha, they are occupied with many things, and latrine construction does not usually appeal to them, nor do they always understand what is meant by efficient protection of a water-supply. As I have said elsewhere, things will not be right until the Royal Army Medical Corps has affiliated to it a body of expert sanitary engineers, under its own control, to carry out the minor sanitary works which are so important. I know there are difficulties in realising such a scheme, but I believe they can be overcome.

In common with many of you, I have the honour to belong temporarily to the Royal Army Medical Corps, and I have seen again and again how the efforts of that corps are frustrated by its dependence on other departments. Too often it gets the blame when it is not blameworthy. Grant it a greater measure of autonomy and you will see what it can do. They say medical men are not, as a rule, good administrators. I deny that assertion. What are the qualities of a good administrator? Foresight, tact, discretion, firmness, energy, and sympathy. What is prognosis but foresight? What is tact if a doctor does not learn it in dealing with his patients? Discretion is surely drummed into the medical man from his student days. He may not always be firm, but his experience at least teaches him to stiffen his back if he is to save life. Few men lead more energetic lives than the medical student, while sympathy is surely the hall-mark of our profession.

No, the doctor can administer if he only gets a fair chance.

A Plea for the Better Recognition of Hygiene.

At the same time I do not think that hygiene is yet priced at its proper value. I would advance a plea, an urgent plea, for its better recognition. Rightly or wrongly, decorations play a great part in army life. When a regular officer is introduced to a stranger in khaki, in nine cases out of ten his eye wanders first to the spot where what has been called the "herbaceous border" flourishes! He will never there see anything associated with sanitary work—I mean it has no distinctive reward. Comparatively rarely indeed has it any reward at all.

And yet the disciples of the goddess Hygeia—be they in the humblest or the highest positions—contribute greatly to the success of our arms, more especially in tropical countries. They have hard work, constant work, often dirty, dangerous, and repellent work. Doubtless it is sufficient honour and reward to labour for the sake of the Empire; but when so many distinctions are conferred, is it asking too much that the claims of the sanitarian should be considered, not, mark you, for his own sake, but to impress upon those ultimately

responsible the fact that army hygiene is a very important section of army life?

Our friends the French are a wise and practical people—the French Army has such a distinction. I understand it has been cheapened; but I maintain the principle is sound, and the recipients of any such honour should not be limited to the Medical Service, but should be chosen wherever an officer or man has shown conspicuous zeal and energy in furthering sanitary measures. There are many other questions of pay and rank, and, I may add, as far as sanitary sections are concerned, of mobility, but into these I may not enter.

I would only say that if ever the above suggestion—which I advance with considerable diffidence, and only because I am certain it is on right lines—if ever, I say, it bears fruit, then I hope the ribbon chosen for the decoration will bear the same colours as the flag of which I spoke—the white of purity, the blue of hope.

THE TREATMENT OF GENERAL PARALYSIS OF THE INSANE

BY THE INTRODUCTION OF SALVARSANISED SERUM INTO THE LATERAL VENTRICLE

AND A SUGGESTION FOR THE ARREST OF TABETIC OPTIC ATROPHY BY THE SAME MEANS.

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IN THE LANCET for May 30th, 1914, each of us published a paper on the introduction of salvarsanised serum into the cerebro-spinal fluid. These papers were based on three cases of general paralysis of the insane in which salvarsanised serum was introduced into the lateral ventricle. The first case was that of a musician: a violin player who had lost the power of using his instrument and the memory of 400 tunes which he was accustomed to play. This first case is still alive and apparently cured. He has returned to his profession of violin playing in a London orchestra, though he is not quite so expert with his instrument as before the onset of the disease. This could not be otherwise since brain cells once destroyed cannot be replaced. It would appear, therefore, that there are grounds for holding that the treatment adopted in this case did arrest the disease and did restore this patient to such a state as now enables him to earn a living. The serum was introduced on two separate occasions (at short intervals) into the lateral ventricle. The first occasion was on March 25th, 1914, so that five years have elapsed since the treatment was carried out. No bad effects have so far followed the operation. The operation as an operation appears to be free from danger.

The Argument.

It is known that *Treponema pallidum* is very sensitive to the antibodies in the blood and to remedies which probably have a direct action on it. The object, then, to aim at is to introduce salvarsanised serum into the cranial cavity in such a way as will admit of the serum coming into contact, by the shortest route, with the brain cells which are in danger of destruction by the syphilitic virus.

There is a general belief that, while antisyphilitic remedies are useful in interstitial syphilis, they are quite ineffective in the lesions of parenchymatous syphilis (i.e., in general paralysis and in tabes dorsalis), in which the parasite would appear to be located between the individual neurons. There is good evidence that the injection of salvarsanised serum into the subarachnoid space of the spinal theca has been followed by improvement in certain early cases of tabes. It may be regarded as certain that the injection of the serum into the spinal theca in general paralysis of the insane is less efficacious than in the early stages of tabes. Is it not fair to hope that benefit would follow the introduction of salvarsanised serum into the subarachnoid spaces of the brain in early cases of general paralysis? The essential points are (1) that the serum should circulate in the peri-neuronic spaces of the brain where the spirochætes reside, and (2) that more salvarsanised serum can be inveigled into these spaces by the intraventricular method than by any other.

Pathology.

As regards the pathology of general paralysis of the insane, it would appear that at the commencement of the secondary stage of syphilis the spirochætes are conveyed by the blood-stream all over the body. Some may gain access to the brain, where they may remain dormant for years. Should they become active the process of general paralysis of the insane is set on foot, and it is at this early stage that treatment should be begun.

Diagnosis.

Unfortunately, cases of general paralysis are rarely diagnosed before the cerebral cortex has undergone extensive disorganisation, so that even if we succeed in arresting the disease at this stage some mental defect is inevitably left. We want to be able to diagnose the disease at the very beginning—in the pre-clinical stage. It is here that the investigation of the cerebro-spinal fluid affords valuable help. In this connexion the following facts are worthy of note.

So long as the central nervous system is not infected by the spirochæte, giving rise to interstitial or parenchymatous syphilis, the cerebro-spinal fluid gives a negative Wassermann reaction, owing to the fact that the capillaries of the central nervous system (those of the choroid plexus among others) are impermeable to the Wassermann substance.

It is quite common to get a positive blood reaction and a negative cerebro-spinal fluid reaction.

A positive reaction of the cerebro-spinal fluid is thus proof positive that the central nervous system is infected with the spirochæte.

When the cerebro-spinal fluid gives a positive reaction the blood generally does so too. This is as we should expect, seeing that the fluid drains off into the general blood-stream.

In rare cases, however, the blood reaction is negative when that of the fluid is positive.

In general paralysis both the fluid and the blood give a positive reaction in practically every case.

If we find the blood negative the chances are nearly 100 to 1 that we have not to deal with a case of general paralysis, but if there is any doubt the fluid should be examined, since in very rare cases of general paralysis the fluid may give a positive reaction, while that of the blood is negative.

In the case of interstitial syphilis of the nervous system we may hope to render a positive reaction of the fluid negative by administering mercury and the salvarsan group of remedies through the blood.

In the case of parenchymatous syphilis of the central neurons this is much more difficult; with general paralysis it is impossible.

By introducing salvarsanised serum into the spinal subarachnoid space a positive reaction of the fluid can be rendered negative in the case of tabes dorsalis.

By introducing the serum into the cerebral ventricles we may hope for a similar result in general paralysis.

Examination of the blood.—The only way to detect parenchymatous syphilis in its earliest phases is by periodic examination of the blood and fluid. The blood of a syphilised person should be examined yearly. Supposing it to be positive, salvarsan should be given intravenously. If the blood reaction remains positive after rigorous treatment by salvarsan and mercury the cerebro-spinal fluid should be tested. If the fluid is found to be positive, early parenchymatous syphilis may be suspected and treatment be pushed by injecting salvarsanised serum into the spinal theca. If after this treatment the fluid remains positive, then the possibility must be seriously considered of the development of general paralysis, and the nervous system must be subjected to a searching examination for clinical evidence of this disease.

In all the great emergencies of surgery early diagnosis alone can lead to early and successful operation. Appendicitis is a good example, but no emergency can be more urgent than that which has for its object the saving of the life of nerve cells, above all those of the cerebral cortex. The method proposed can only be fully effective in the very earliest stage of disease before extensive damage has been done to them. We repeat that the pre-clinical stage of syphilitic brain disease is the ideal time; indeed, one might say it is the only time for the commencement of curative treatment. Clinical experience offers many examples of the course of the stream of the cerebro-spinal fluid. For example, in fulminating subarachnoid meningitis, spreading

from infection of the base upwards over the cortex, the pus fills up the sulci between the convolutions and *soaks* into the grey matter of the cortex along the sheaths of the pial vessels. This is exactly the course which it is desired that salvarsanised serum should take when mingled with the cerebro-spinal fluid. In this way the serum must inevitably reach the peri-neuronic spaces of the cortex, especially in the neighbourhood of the Sylvian and Rolandic rivulets. Thus it appears clear to us that the serum introduced into the ventricles does reach the anchorage of the spirochæte.

Optic Nerve Atrophy in Tabes.

We suggest that the same method might be employed to arrest tabetic nerve atrophy. The optic nerve has a sheath derived from the dura mater, another derived from the arachnoid, and another from the pia. The space underneath each of these sheaths can be separately injected, as was shown and figured by Key and Retzius. The injection beneath the arachnoid sheath passes into the substance of the optic nerve, and if made into the subpial space passes into the optic nerve and extends as far as the papilla, and this, it is suggested, should be the path which the curative serum should voyage so as to save the essential elements of the papilla and retina from destruction. Whether the injection should be made into the lateral ventricle or through the outer angle of the sphenoidal fissure into the subarachnoid space at the base of the brain remains to be determined.

The demobilisation of the British Army and the probable increase of syphilis in this country make it highly desirable that any means which may have a remedial influence on syphilitic infections of the nervous system should receive careful study.

MALARIA AND TRENCH FEVER.

BY GORDON WARD, M.D. LOND.,
MAJOR, R.A.M.C. (S.R.)

THE close resemblance between these two diseases does not seem to be generally appreciated. It is proposed to compare them under headings from predisposing causes to termination. [Owing to lack of space observations on predisposing causes, parasites of the diseases, and insect hosts are omitted.] As to the development of the parasites in man, the similarity of the two processes in man can only be inferred from the similarity of their effects. In both diseases the onset usually seems abrupt, but indefinite prodromal symptoms are almost certain in each case.

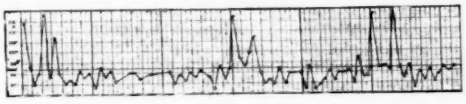
The Acute Attack.

In malaria this is ushered in with a rigor, in trench fever a rigor is uncommon, but it does occur. Also, when malaria is "toned down" by continual administration of quinine rigor is unusual, although pyrexia and all the other symptoms may be present. A hot stage and sweating are not uncommon in trench fever. Headache, nausea, and pain are common to the acute attacks of each disease. Enlargement of the spleen, usual in both, is perhaps more obvious in malaria.

In malaria we assume, undoubtedly wrongly, that the symptoms of the relapse are due to the sudden multiplication of parasites in the peripheral blood. When patients are under the influence of quinine they very often continue to have undoubted relapses, but the parasite is very seldom found in the peripheral blood. Sporulation may be proceeding only in the internal organs—and it is also possible that the relapses of trench fever are due to the sporulation of its parasite in the same places. Moreover, these minor relapses of malaria in patients taking quinine are not affected by increasing the dose of quinine. Thus the failure of quinine to affect the trench fever parasite is less surprising and the similarity of the two diseases more apparent in this particular than would have been thought. If we assume that quinine merely makes it impossible for the parasite to reach the peripheral circulation we have a complete explanation of the course taken by malaria in persons *under the influence of quinine* and of the relatively small part played by anæmia in such persons. It is precisely these persons who most resemble cases of trench fever, in which also anæmia is a small factor. It may be noted that in both diseases extreme pallor is much more common than extreme anæmia, and as will presently be shown there are other similarities in the vaso-motor symptoms of the two diseases.

The acute attack of malaria is usually considered to consist of a single rise of temperature, while in trench fever we find daily rises for three or more days. But Chart 1 shows that even malaria (under the influence of quinine in this case) has a tendency to groups of rises of temperature. Charts 2 and 3 are suggestive of the same grouping and are very similar to many trench fever charts.

CHART 1.

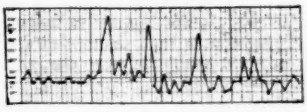


From a case of malaria taking 10 gr. of quinine daily during the period shown. *Plasmodium vivax* found. Showing tendency to grouped rigors at several days' interval.

CHART 2.

From a case of malaria taking quinine throughout the period of observation. *Plasmodium vivax* found. Showing three five day intervals and one fifteen day interval.

CHART 3.



From a case of trench fever developing while patient was in hospital for diarrhœa. For comparison with Chart 2.

In trench fever the unknown parasite seems to be in the blood stream, and it is possible that it could be confined to the internal organs by the use of quinine.

Shin Pains and Other Pains.

If the pains of malaria and trench fever be analysed it will be found that certain of them, and in particular those felt in the legs and back, are dependent on cutaneous hyperalgesia which can be detected by the flinch following a slight pin-prick. The hyperalgesia covers definite areas corresponding to the distribution of nerves from particular segments of the spine. For these two diseases the hyperalgesic areas, and therefore the spinal segments in connexion with them, are the same. In neither case is it known what causal condition stands further back than the spinal segments, but there is a strong presumption that it is a disorder of viscera connected with the same segments—the whole phenomenon being comparable to any simple reflex. This aspect of the problem has recently been worked at by Carmalt Jones,[1] who dealt chiefly with trench fever, and the writer has not only seen some of his cases, but has since verified his findings in many cases of malaria and a certain number of trench fever.

The writer is not prepared without further evidence to accept any absolute diagnostic criterion based on hyperalgesias, but as showing the affinity of the two diseases these researches of Carmalt Jones are of undoubted importance. All three areas (C. 8 and D. 1, D. 7, and L. 1 to 5) are usually found in any individual case. The second area is associated in the writer's experience with two or more lower dorsal segments. They are much better set forth in the article referred to.

Of the three groups the first seldom gives rise to clinical symptoms other than pain across the shoulders, and this is more frequent in trench fever; indeed, all the pains are more frequent or more severe in trench fever, although occasionally the maximum of severity is met with in malaria. The second group accounts for a good deal of the pain in the side, usually considered due to the spleen, perhaps quite rightly, although the mechanism is not usually recognised. The third group accounts for the pain in the small of the back and for the shin pains. All these matters anyone may test and verify for himself. It is probable that

[1] THE LANCET, Oct. 5th, 1918.

the explanation will be provided by a more searching study of the autopsy findings in malaria.

The effect of exercise, &c.—The effect of allowing a trench fever patient out of bed too soon is usually to precipitate a recurrence of the pains and a rise of temperature and pulse-rate. The writer has over and over again observed the same in a particular type of malaria—viz., the type that shows continual minor relapses in spite of quinine. It would be interesting to know whether a relapse of spirochætosis icterohæmorrhagica or of relapsing fever can be thus hastened. It is extremely interesting that so small a cause should lead the malarial parasite to sporulate within a few hours.

Other Symptoms.

Headache and eye changes.—In both diseases the headache is usually frontal, less often temporal, and rarely occipital. In malaria the writer has frequently been able to map out a hyperalgesic area corresponding to the distribution of the supra-orbital nerve. In trench fever the same area is affected. So far these fevers probably do not differ from many others. In both, however, there is, in addition, a great tendency to involvement of that part of the supra-orbital nerve within the orbit. This gives rise to "pain behind the eyes" and also to pain on moving the eyes. These are common in both diseases, as are also photophobia and some degree of conjunctivitis. Nystagmus or, more correctly, nystagmoid jerking, is frequent in trench fever. It is not usually mentioned as a symptom of malaria, but the writer found it quite frequently present. His impression is that photophobia is more frequent in trench fever and headache more chronic and persistent in malaria.

Vaso-motor symptoms.—The term "vaso-motor" is sometimes held to imply that those who use it imagine that the suprarenal glands are necessarily involved. The writer does not accept this implication—the term is a convenient one and the sort of symptom to which it applies is generally understood. The most startling of these symptoms is the transient hemiplegia sometimes seen in malaria, but more often observed in aged persons the subjects of arterio-sclerosis. The writer is not aware of a similar happening in trench fever, but it may be expected to occur, and should not cause alarm.

Symptoms reminiscent of Raynaud's disease are moderately common in chronic malaria. Dead fingers and dead feet will often be found if looked for. In one case inhalation of amyl nitrate seemed to definitely reduce the area affected. These symptoms are recorded by American observers in trench fever, but have attracted little notice.

A condition more nearly allied to erythromelalgia is also met with in malaria, the legs becoming more red and painful when allowed to hang down. This has also been seen by the writer in trench fever. In view of the fact that the lesion in erythromelalgia has been shown to be an arteriolitis, it is probable that the same is true of malaria, a supposition which the writer feels may derive support from the fact that he has frequently found groups of two or three endothelial cells in the peripheral blood in malaria, but very seldom in any other disease.

A further vaso-motor phenomenon is local œdema of the shins, the calves, the dorsum of the foot, &c. Several cases of this sort have been watched by the writer. They were usually of three to five days' duration and in no case was there any albuminuria.

The vaso-motor symptoms of trench fever seem to have had very little attention, and it is hoped that those who have to do with this disease will be on the look out for symptoms such as those detailed above.

Duration of the Disease.

The duration of malaria after return to a country in which reinfection could be excluded is, in the writer's experience, 3 months to 15 years. Several cases have been noted in which the parasite was still present 5 to 10 years after return from India.

With regard to trench fever, Major H. F. Marris informs the writer that he knows of at least one case which remained febrile for two years. There has not been time to follow cases longer. It is important to realise that trench fever may prove to be a very lasting infection in some cases and to know what sort of symptoms such cases may be likely to show. The writer believes that these will be very similar to those exhibited by malaria in similar circumstances—viz., wasting, intermittent pyrexial attacks, headache, various vaso-motor abnormalities, and serious debility.

Differential Diagnosis.

A few lines may be devoted to differential diagnosis without the assistance of the laboratory, for there is yet no sign that laboratory facilities will be more easily available for the poor than they were before the war.

Rigor is usual in malaria provided the patient is not taking quinine. It occurs but is unusual in trench fever.

Quinine controls the temperature in malaria in most cases—i.e., prevents more than one or two further rises to 103° or 104° F. This, of course, applies to temperate climate malaria. Quinine has no effect in trench fever.

A rash is absent in malaria, but may be seen in trench fever.

Leg pains are more frequent in trench fever, but may be of equal intensity in malaria.

Some cases of malaria show a general pigmentation (often well seen in the lips) which increases with attacks and diminishes between them. This is not seen in trench fever.

Finally, it is to be remembered that now trench fever and malaria may be contracted *de novo* in England and that the fact that a patient has suffered from one of them will not necessarily enable him to distinguish between a relapse of that one and the onset of the other.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

A MEETING of this section was held on April 3rd, Mr. J. D. MALCOLM, the President, being in the chair.

Specimen showing Fœtus during Spontaneous Evolution.

Mr. CLIFFORD WHITE described a case in which the fœtus was undergoing spontaneous evolution and was removed by laparotomy during labour. When first seen at hospital the uterus was in continuous contraction, the vulva was œdematous, and there was an offensive vaginal discharge. The pelvis was not contracted. Both arms, the right leg, and the cord were prolapsed into the vagina and the cord was not pulsating. The arms were amputated, and weight traction was attempted by attaching a 7 lb. weight to the foot. This had little effect, and the abdomen was opened, when it was found that the pouch of Douglas contained blood-stained fluid, the lower uterine segment was tense and thinned, and the uterus as a whole would not come out of the pelvis. The gravid uterus was then excised, but just before this operation was completed it slowly underwent the process of rupture, which occurred as follows: the peritoneum covering the right side of the lower segment cracked into pieces about 2 cm. across, a little blood appeared at the cracks, and then the muscular tissue yielded gradually and allowed portions of the fœtus to be seen. The vagina was cut across and the uterus with contents removed without delay. The patient died suddenly three hours after the termination of the operation. The specimen was shown, and was of the usual size of a child at term. The cervical spine was flexed to the fullest extent, so that the child's head was embedded in the abdomen and the right parietal eminence was in contact with the pubis. Both arms were prolapsed and forced together. The right leg was extended, the toes being on a level with the humerus of the prolapsed arm. The left foot was in contact with the left ear. The specimen showed the condition of the fœtus during spontaneous evolution, the efforts of the uterus to overcome a transverse presentation by this process failing probably because of the increased difficulties occasioned by the prolapsed extended right leg and the fact that both arms were in the vagina.

Dr. EARDLEY HOLLAND suggested that it was not always wise to remove the uterus; the woman was already in a state of shock, which the extended operation of removal of the uterus would increase. It was better to leave the uterus and run the risk of sepsis.

Dr. G. DRUMMOND ROBINSON and Dr. G. F. BLACKER also spoke.

Mr. WHITE, in reply, said that he had excised instead of doing Cæsarean section as, from the condition found, peritonitis was bound to occur. With regard to the question of shock, he thought that removal of the uterus would only very slightly prolong the operation.

Extra-uterine Pregnancy Continuing to Term.

Mr. GORDON LEY gave a record of two cases of extra-uterine pregnancy continuing to term, together with an account of 100 cases from the literature on the subject, and conclusions to be drawn therefrom.

In the first case, a woman aged 36, there had been enlargement of abdomen and absence of menstruation between December, 1911, and October, 1912. After this time she had become smaller but the lump had persisted, decreasing in size rapidly at first, but remaining at its present size for years. She felt the baby during April and June, 1912. During March to May, 1918, there had been pain in the back and considerable loss of weight. On abdominal examination there was a stony hard mass lying across the mid and lower abdomen, somewhat of the shape of a fœtus in the normal attitude, lying transversely with the head to the left and the breech to the right. On vaginal examination a normal cervix and lower uterine segment could be recognised; above this the uterus could not be defined. There was a soft fixed mass completely filling Douglas's pouch. A diagnosis of full term extra-uterine pregnancy was made and confirmed by an X ray photograph. Operation was performed and the sac removed with the left tube and ovary, a normal right tube and ovary being left, together with the atrophic uterus. Convalescence was undisturbed, and the patient returned home on the sixteenth day after her operation. The specimen was shown. The fœtus weighed 3lb. 1oz. It was bunched into a position of extreme flexion and compressed to the smallest possible bulk, the feet and hands being flattened. The state of preservation was good. This appeared to be a case of secondary abdominal pregnancy, the ampulla of the left tube being the primary site of the gestation sac. The tube had apparently given way posteriorly and the fœtus and membranes had passed through the rent into the peritoneal cavity. The placenta had in part remained *in situ* and in part become attached to all structures forming the floor of Douglas's pouch.

The second case was that of a woman aged 28 years, who had been married for three years; no children and no miscarriages. She was seen on July 2nd, when a diagnosis was made of a full-term pregnancy in the right broad ligament. The uterine mass gradually diminished between the 4th and the 16th, at which time it was about the size of a 10 weeks' pregnancy. The abdomen was opened on the 16th, the child having been dead about 21 days, and the condition was found to correspond exactly to the physical signs. There were many adhesions, and as during the operation a large blood sinus was encountered and bleeding was only controlled with great difficulty, it was obvious that the uterus would have to be removed. Before the operation was completed the sac ruptured and the baby was expelled. The cord was cut and the baby removed and the operation completed. There was severe shock and no small amount of blood lost, but the patient stood the operation well. The difficulties encountered were considerable owing to the absolute impossibility of controlling the blood-supply prior to dissection. The patient was now in perfect health except for a right uretero-cervical fistula which persisted. The specimen was shown, consisting of the uterus and the sac. To the right anterior, external, and upper wall of the sac an irregular placenta was attached. Accompanying the specimen was a female fœtus in an early stage of maceration, weighing 4 lb. 7 oz.

In the first case, except that the separation of the adhesions made the work slow, no difficulties and no bleeding were met with. He felt, therefore, that if it were safe to leave a dead full-term ectopic fœtus in the abdomen for months this should be done in all cases in which the child was dead at the time when the patient was first seen. In the second case the vascularity and the inability to render the sac bloodless before freeing it were the main difficulties. If he had met this case again he would open the sac first in spite of the risk of peritoneal infection, remove the fœtus, and then remove as much of the sac as possible with the placenta, marsupialising and draining or packing the remainder of the sac.

Mr. Ley then gave an analysis of 100 cases which he had collected, and described what he considered to be the ideal treatment. That the child was worth saving was certainly beyond doubt provided the life of the mother was not endangered thereby. With regard to the time of the operation he thought that cases of extra-uterine gestation at or near term should be operated on during the life of the child whenever possible, and, in view of the great risk of septic infection of the sac, operation should not be delayed even after the death of the fœtus; delay only resulted in increasing the risk of sepsis without ensuring anæmia of the placental site. With regard to the type of operation, removal of the sac was undoubtedly the ideal treatment. When this was impossible marsupialisation of the sac, with removal of the placenta and drainage of the sac or plugging it with gauze, should be carried out whenever possible. Where attempts to remove the placenta caused profuse hæmorrhage the sac should be marsupialised, packed with gauze, and the placenta allowed to come away piecemeal.

A Specimen shown 105 Years Ago.

Dr. HERBERT WILLIAMSON showed a specimen from the Museum of St. Bartholomew's Hospital, which had been exhibited at a meeting of the Obstetrical Society 105 years previously. It consisted of one of the lower limbs of a fœtus of mature growth which was contained in an osseous cyst, and had remained within the abdomen of the mother for 52 years until her death at the age of 80. The paper was written by Richard Brown Cheston, M.D., F.R.S., of Gloucester, and was communicated to the society by Sir William Lawrence.

Four Cases of Full-time Ectopic Pregnancy.

Dr. H. R. ANDREWS gave a short account of four cases of full-time ectopic pregnancy which had been under his own care. In the first case the patient had only two pregnancies, both tubal, with an interval of eight or nine years between them. She sought advice on account of vomiting after three months' amenorrhœa. A very hard irregular mass was found in the abdomen, its lower pole fixed in the brim of the pelvis. There was a soft swelling filling up the pelvic cavity. The diagnosis was one of lithopædion impeding the growth of the pregnant uterus. The lithopædion, 17 inches in length, and weighing 3 lb. 5 oz., was removed. Below it was a 3½ months' tubo-ligamentary pregnancy with a tiny embryo. The second case was one of infection of a pregnant right rudimentary horn, four months after a mock labour a little before full time. The diagnosis could be made with certainty. The whole uterus was removed. The fœtus measured 17 inches. The third case was one of full-time pregnancy in a rudimentary right uterine horn, seen two months after term. There could be no doubt about the diagnosis. The tumour, containing a fœtus weighing 4 lb. 14 oz., was removed, the uterus, both ovaries, and the left tube being left behind. All three patients made good recoveries. The fourth case was seen by Dr. Andrews in consultation about two months after term, in 1902, and a diagnosis of full-time extra-uterine pregnancy was made. She was admitted into a hospital, but the obstetric physician in charge considered that no operation was necessary. Dr. Andrews saw her again 12 years later, after she had had attacks of abdominal pain, vomiting, and diarrhœa, and had passed a large number of bones per rectum. He opened the abdomen, but found adhesions of such density that he made no attempt to remove the sac. Besides these he had seen two cases of full-time extra-uterine pregnancy operated on by the late Dr. Herman some months after term. No infection had occurred. In one case the sac was removed as if it had been an ovarian tumour; in the other the uterus had to be removed as well, as the placenta was widely attached to it. Dr. Andrews pointed out the difficulty of diagnosis in some cases of ectopic pregnancy. He was impressed by Mr. Ley's demonstration that in many cases thrombosis did not occur until many months after fœtal death.

Other Cases.

Mr. G. BELLINGHAM SMITH described a case of Extra-uterine Pregnancy which had been under his care from the fifth month. He drew attention to the difficulties of diagnosis as between normal pregnancy, unilateral distension of the uterus, and pregnancy in a horn. The patient went to full term and had labour-pains which passed off. About this time the child died. Three weeks later, after laparotomy, the sac was exposed and opened, and the child, which was much

deformed, was removed. The placenta, which was in the lower part of the sac, was peeled off with very little oozing of blood. The superfluous parts of the sac were removed, the lower part drawn up and sewn to the lower angle of the wound, and the wound closed. The sac was packed with gauze for 24 hours, and was then removed, and the wound closed without any sepsis or further trouble. In view of the ease of the operation and the successful result the speaker thought that in any future case he would follow the same procedure.

Mr. WHITE showed a specimen of a Full-time Pregnancy in a Rudimentary Uterine Horn, which had been given him for investigation by Dr. Angus Kennedy, of St. Mary's Hospital for Women, Plaistow. It consisted of the body of the uterus, the gestation sac, the right tube and ovary, and the stumps of both round ligaments. Dr. Kennedy had performed Cæsarean section and removed a dead male child, of full size and well formed. The uterus had been removed by subtotal hysterectomy, together with the appendages on the right side. No signs of impending rupture had been noticed, and the patient had made an uneventful recovery. The position of the round ligament indicated that the specimen was either from a case of pregnancy in a rudimentary horn or an interstitial pregnancy, probably the former.

The PRESIDENT showed a Fœtus and Placenta which had been removed with their containing sac by Major Cecil Marriott, of Leicester, three months after a spurious labour following nine months amenorrhœa. The operation presented no serious difficulty and recovery was good. He also mentioned a very similar case in which, after seven weeks amenorrhœa, there had been daily hæmorrhages for three months followed again by amenorrhœa. The diagnosis was difficult on account of the intimate connexion between the uterus and the extra-uterine fœtation. In this case, also, there was no difficulty in removing the sac complete and satisfactory recovery followed.

Dr. A. E. GILES confined his observations to three points: (1) The ways in which a full-term extra-uterine pregnancy could occur; (2) diagnosis; and (3) treatment. He thought that every case began as a tubal or as an ovarian pregnancy. When a gravid tube ruptured the sac might be extruded towards the peritoneal cavity, resulting in what he regarded as a "primary abdominal" pregnancy. If the rupture took place into the broad ligament a mesometric pregnancy occurred and might go to term as such; on the other hand, there might be a secondary rupture into the peritoneal cavity, resulting in a true "secondary abdominal" pregnancy. Another possibility was a tubal abortion of such a character that the sac was extruded from the fimbriated end of the tube without disturbance of the placenta. Before full term a diagnosis might be suggested in two ways: the first was an abnormally easy palpation of the fœtus in cases where it was lying free in the abdomen covered only by the amnion; the second was resonance over the front of the abdomen right down to the pubes, which would never occur with an intra-uterine pregnancy. The most debatable question was the time when operation should be undertaken. He still held the opinion that the extra-uterine fœtus was not, in insurance phrase, a "good life," and Mr. Ley's figures corroborated this view. It appeared to him to have been demonstrated, both by experience and by Mr. Ley's figures, that it was safest for the mother if operation were delayed a few weeks after the child's death. The variety of the conditions met with justified the warning that a surgeon who met with an easy case must not too lightly assume that the next would be equally easy.

Discussion of Operation.

Dr. J. P. HEDLEY said that he thought the greatest danger in dealing with cases of full-term extra-uterine pregnancy was from hæmorrhage, and, in comparison, the danger of infection of the dead ovum was small. In midwifery the general rule was to consider the mother's life first; he therefore felt that operation in these cases should not be undertaken until two or three months after the death of the child unless there was some very urgent reason. By waiting two or three months after the placental circulation had ceased there were good grounds for hoping that thrombosis would have taken place in the maternal vessels supplying the placental site, and this certainly was so in the majority of cases recorded. When operation had to be performed while the child was living, or soon after its death, he would advise leaving the placenta behind and closing the abdomen, unless the former was attached in a position unfavourable for ligature of the vessels leading to its site.

Dr. J. S. FAIRBAIRN said that he had operated on three cases of advanced extra-uterine gestation; two were fatal, and in one both mother and child survived. In the first case six weeks after term separation of the edge of the placenta was followed by bleeding so severe that the patient was sent back to bed with the abdomen packed with gauze and towels; she collapsed and died shortly after a second attempt a week later to remove the placenta, when profuse hæmorrhage again occurred. The second case was a seven months pregnancy. The patient collapsed about four hours after the operation from severe hæmorrhage during the separation of the placenta. The third case was that of a woman of 28 who had had a child at the age of 18, had been a widow for seven years, and had remarried in 1912. There was amenorrhœa for six months, followed by three slight losses of blood, and with the last of these what she thought were labour pains. *Bacillus coli* infection of the urine was also present. On admission to hospital abdominal examination did not suggest an extra-uterine pregnancy, but vaginal examination at once raised the suspicion of this condition, and examination under anæsthesia made the diagnosis clear. As there had been vomiting for some time, abdominal distension, and marked deterioration in her general condition, operation was performed, which confirmed the diagnosis. The uterus was found to be nearly the size of a four months gestation, and enclosed in the right broad ligament was the sac containing the fœtus. The sac was opened and the fœtus removed. Hæmorrhage was easily controlled and the sac was removed by clamping and ligaturing the broad ligament. Three pints of saline were given intravenously during the operation, which the patient took fairly well. The child, a male, weighed 3 lb. 14 oz.; respiration was soon established after a hot bath. The pregnancy appeared to have been primarily tubal and had either ruptured intra-ligamentally with a secondary rupture into the abdomen, or had been extruded from the tube and obtained a secondary attachment to the broad ligament. On discharge the patient was in good condition and her child weighed 6 lb. 9 oz. Dr. Fairbairn thought that it was useless to wait for the death of the child. The most straightforward of his cases was the one in which the child survived, the most difficult the one in which it had been dead for six weeks. The trouble depended almost entirely on the position of the placenta. When the sac and its attachments could be ligatured and removed the procedure was straightforward; when the placenta had to be separated from some irremovable part the bleeding, even two months after the death of the child, might prevent the operation being completed.

Dr. T. W. EDEN said that he had operated on two cases, in neither of which had he had any difficulty with hæmorrhage. He agreed that operation should be done at once. There was no certainty as to when thrombosis occurred in the maternal sinuses, and there was risk of sepsis all the time. It was always necessary to try to remove the placenta, and once begun this must be continued. In his experience arrest of hæmorrhage was not always as difficult as it looked.

Dr. F. J. MCCANN said that it was difficult to make rules, but he thought that it was better to deal with cases as soon as they were seen. There were two basic principles—preliminary ligaturing of the ovarian vessels high up and rapid separation of the placenta.

Dr. A. LAPTHORN SMITH said that of 55 cases of extra-uterine gestation in which he had operated 3 patients died and 52 recovered. His invariable rule was to operate immediately when there was reasonable evidence that the condition was present. He gave an account of a case in which the child was alive and was removed without any difficulty, but on beginning to detach the placenta there had been profuse hæmorrhage, and in spite of all efforts to arrest it the patient died on the operating table. He himself preferred to leave the placenta, regarding it as the best packing for the blood sinuses, and in time it would be digested.

The PRESIDENT said that he preferred to operate early. He related a case of a four and half months pregnancy in which operations repeatedly had to be stopped on account of hæmorrhage, but at the last attempt no bleeding occurred.

Mr. W. GILLIATT also showed a specimen.

Mr. LEY briefly replied.

SECTION OF OPHTHALMOLOGY.

A MEETING of this section was held on March 28th, Mr. W. T. HOLMES SPICER, the President of the section, occupying the chair.

Exhibition of Cases and Specimens.

Mr. ELMORE BREWERTON showed a patient who presented extensive Angeioid Streaks in the Retina. The cause of them seemed to be obscure, and different observers had suggested varied explanations. Ward Holden considered them to be remains of hæmorrhage diffused in a linear direction through the layers of the retina, but this could only take place in the nerve-fibre layer, and these streaks were not in that layer. Neither were the streaks new vessels. One observer watched streaks of blood develop later into streaks similar to those in the present case. Mr. Brewerton's own view was that they were the remains of blood between the retina and choroid; their colour was that of hæmatin. They were probably a sequel of a chronic inflammatory process.

The PRESIDENT described the appearance in two similar cases of his own, in which he attributed the streaks to vascular disease. One of the patients suffered greatly from hæmatemesis and was very anæmic. He did not doubt that the situation of the streaks was between the retina and choroid.

Miss ROSA FORD showed a case of Congenital Pigmentation of the Cornea and one of Pituitary Tumour. In regard to the last of these the exhibitor was not certain of the diagnosis, as she was not aware of any signs of disturbance of the pituitary secretion. There was marked contraction of the fields, left homonymous hemianopsia, and a right scotoma in the right eye. Skiagraphically, the sella turcica seemed quite normal.

Mr. H. B. GRIMSDALE exhibited a case of Pulsating Tumour of the Orbit of Uncertain Nature. It appeared to be connected with the supra-orbital vessels. Pressure of the carotid on the same side as the tumour stopped the pulsation. Probably it was aneurysm, but the situation was unusual.

Mr. RAYNER BATTEN showed a case of Disease of Both Maculæ. The patient had had acute papillitis, and three years ago she lost her sight altogether in the course of a fortnight. Three months later it returned to allow of perception of light. She now had opaque white discs and symmetrical disease of the maculæ. The onset of this condition seemed to have occurred in most of the cases about puberty, in both sexes. This girl did not menstruate for a year, and she attributed the onset to this fact.

Major CARRUTHERS showed, in a soldier from the front, an Intra-ocular Growth. The left eye was greatly proptosed, and the skiagram showed a dark shadow. Wassermann was negative. The history was of about four months' duration. The patient had no pain or discomfort until the commencement of diplopia. When first seen by the exhibitor, the most noticeable feature in the eye was 2 D. of optic neuritis; which later increased to 4 D. On the advice of a colleague he put the patient on mercury and iodides, and this was followed by chemosis, entirely lymphatic: there was no vascular engorgement. Later, this subsided, as well as the optic neuritis, which raised the hope that it might prove to be a gumma. But since then it had been *in statu quo*, the papillœdema being ½ to ¾ D. Within the past week, keratitis punctata had appeared. The antrum and the sinuses appeared to be normal.

Mr. A. W. ORMOND showed a case of Pituitary Tumour. The antra and sphenoids had been explored, but without result. The X ray picture showed very definite enlargement of the sella turcica, and much erosion of the sphenoid. The visual fields were atypical as the hemianopia was more on the nasal than on the temporal side. He asked advice as to whether puncture should be carried out through the sphenoidal, on the chance of it being cystic and thus being able to afford relief.

Mr. J. HERBERT FISHER agreed as to the probability of the case being one of malignant growth in the pituitary region with very extensive destruction of the sella turcica. He did not recommend puncture.

Mr. L. V. CARGILL also showed a case of Pituitary Tumour in a patient, aged 22, who looked much younger. Skiagraphic record gave strong confirmation of the diagnosis.

Mr. FISHER regarded this as a case of primary disorder of the pituitary body itself and the secondary sex characters supported the idea; the pituitary disorder started on the completion of adolescence. He quoted a similar case from his own experience.

Dr. JAMES TAYLOR agreed with Mr. Fisher's view that this condition was possibly due to destruction or damage of the pituitary body by cystic growth. He counselled giving the patient pituitary extract before considering any operative procedure. Failing relief, exploration might be carried out.

Malignant Tumour of the Pituitary Body.

Captain G. MAXTED, in a paper on this subject, described the case of a man, aged 25, who, a month before admission, had diplopia, which had been preceded for 11 months by slight occasional attacks of epistaxis. He had also suffered from intermittent headaches. The palpebral fissure was wider on the right side than on the left. The right pupil was semi-dilated and fixed; there was no consensual reaction. The epistaxis was reported to be due to chronic pharyngitis. Later the headaches were more troublesome, and pus was coming from the nose or back of the throat. There was also increasing anæmia, and the left external rectus muscle was becoming weak, in addition to the trouble in the right eye. The cerebro-spinal fluid was, on puncture, found to be under tension, but the Wassermann test performed on it proved negative. Then there was a complaint of dizziness, and when the right sphenoidal sinus was explored a soft hæmorrhagic mass, resembling growth, was found, and the posterior wall of the sinus was eroded. On recovering from the anæsthetic, after the operation of de-compression, the patient noticed that his sight was much worse, and in a few hours he was practically blind, and on the following morning completely so. No swelling of the disc could be detected. In five days the blindness began to clear up. The sella turcica was found, skiagraphically, to be considerably enlarged. The fields of vision showed striking bi-temporal hemianopia. A radium tube of 100 mg. was inserted for three hours, but the result was unfortunate, for five days later the temperature rose, the patient became delirious, collapsed suddenly, and died. Post mortem, a growth was found in the sella turcica, there was much erosion of the surrounding structures, and the optic nerve and optic chiasma were stretched over the growth. Both cavernous sinuses were distended by masses of tumour to three times their normal size. The growth had not penetrated the dural sheath. The growth was not removable *en masse;* it was hæmorrhagic throughout, and its colour was almost that of chocolate. Even the apex of the left petrous bone had become eroded. It was a carcinomatous tumour which was undergoing cystic degeneration. Nothing could be ascertained or found which would throw any light on its origin. The patient had periods of great listlessness, but there were no indications of sexual abnormality.

The paper was discussed.

Migraine.

Mr. FISHER read a paper on Migraine. He said the primary classical symptoms of migraine were the scintillating scotoma followed by localising and usually unilateral headache, which culminated in nausea or even vomiting. In his own case there was, during the attacks, a marked reduction in pulse-rate, sometimes to 46, and a striking increase in renal activity. He had never had disturbances of vision. Often there was a familial tendency about the disease, as well as a periodicity in the attacks. In the female the attacks often coincided with the menstrual periods, ceased during pregnancy, and usually terminated finally with the establishment of the climacteric. In the male the attacks tended to cease at about the fiftieth year. The migraine spectrum usually lasted 20 to 30 minutes, and was only of a lowly order, neither so brief nor so elaborate as that of epilepsy. The visual spectra of migraine could, he thought, be produced by irritation of the visual fibres at the base of the brain. There could be only one region where a lesion, slightly varying in incidence, could reach the various parts of the basal fibres so as to explain all the varieties of the migraine scotoma—namely, the inter-peduncular region—and hence he suggested the pituitary body as the exciting agent. Slight swelling of the hypophysis would enable it to exert enough pressure to irritate the visual fibres in any of the required positions, and the other features of migraine offered no contradiction of the view, as he showed by a careful statement of the case.

Dr. GORDON HOLMES pointed out that this was not the first occasion on which the cause of migraine was attributed to the pituitary body; and he contested the view advanced by Mr. Fisher. He knew of no evidence that irritation of the optic tract could produce such positive subjective symptoms.

Dr. TAYLOR said he would hesitate to accept the phenomena of migraine as evidence of anything except cortical irritation.

Mr. LESLIE PATON was sceptical as to the view enunciated, and discussed the subject from the standpoint of his own personal experiences.

Mr. M. S. MAYOU said he knew of cases in which the migraine was worst during pregnancy.

The discussion was continued by Professor J. H. PARSONS, Mr. J. B. STORY, and the PRESIDENT, and Mr. FISHER replied.

COMBINED MEETING OF OPHTHALMOLOGICAL AND LARYNGOLOGICAL SECTIONS.

A MEETING of the Sections of Ophthalmology and Laryngology was held on April 2nd. Mr. W. T. HOLMES SPICER, President of the first-named section, occupied the chair. He referred to an occasion when the Section of Ophthalmology held a joint meeting with that of Otology and the benefit derived from it. From this further attempt at coöperative study he hoped for an equally good result, especially after the large and varied experience which the great war had produced. The desire for this meeting originated with the ophthalmic surgeons, as they wished to know a great deal more about the dangers which beset the precious optic nerve, from the eye throughout its course to the brain, yet most of that region was out of their province. He remembered the time when there was but little expert knowledge concerning the ethmoid and frontal sinuses, and when the departments of ophthalmology and laryngology at large hospitals were in charge of physicians; the outlook on these specialties was a purely medical one. The ophthalmic surgeon desired to know when to call in an expert in a case in which the accessory sinuses seemed to be at fault.

The subject of debate was

Injuries and Diseases of the Orbit and Accessory Sinuses.

Mr. L. VERNON CARGILL opened the discussion. He said it was surprising to find that the cases of optic complications from sinus trouble were so few, because of the thinness of the dividing partition between sinus and orbit. Ophthalmic complications might present themselves as functional disturbances or as toxic effects. There might be contraction of the peripheral field, central scotoma, papillœdema, papillitis, uveitis, episcleritis, sub-retinal effusion, retinal detachment, and so on. Nasal sinusitis—ethmoidal, frontal, or maxillary—was a chief cause of orbital inflammation. There was a small group of cases comprising retrobulbar conditions, and a larger one consisting of sub-periosteal inflammations caused by extension from the nasal sinus. In ethmoidal cases an acute specific fever seemed to be the usual primary cause. In young children acute cases often responded to fomentation and good nursing. He thought it a practical question to ask whether the staff of an ophthalmic hospital should not include a rhinologist. The endonasal treatment of some cases had proved sufficient. In some an exploratory operation was needed so as to definitely exclude—or detect—sinusitis. If expectant treatment was not succeeding, incision should be made without delay. The proportion of injuries caused by shell fire compared with those inflicted by rifle bullets was much greater in this war than in the South African war, and the sinuses had suffered in a correspondingly greater degree. But practically every case in which the wound was purely orbital had made a good recovery. The regular use of anti-tetanic serum was of definite benefit, and much assistance was derived from stereoscopic radiographs, the telephone probe, and the electro-magnet. Unless they were causing trouble no attempt was made to remove deeply situated foreign bodies. The maxillary sinus was the most frequently injured; the essence of the treatment was free drainage and irrigation. He described and illustrated a variety of cases.

Mr. G. SECCOMBE HETT said not only were such combined meetings a great help towards the successful treatment of cases caused by the war, but the improved knowledge would be a useful asset in treating civil cases of injury produced industrially. During the last three years of the war his experience had been with cases after their arrival in England. Put briefly, the best results followed free drainage and as little movement of bony or soft tissues as possible. Mucous membrane was stitched to skin and was not taken away; sometimes he had been able to reconstitute an eye-socket because the conjunctival mucous membrane had been retained, although apparently the lower lid had been destroyed. He showed a numerous collection of slides selected from his large experience in facial renovation derived in the war.

Mr. A. W. ORMOND spoke of the cases which had come under his care at the 2nd London General Hospital during the last four years, in which time several hundred orbit and accessory sinus cases had been under treatment in his wards. He said it could not be claimed that serious damage to orbits and sinuses resulted in any subtle change in vision; the results were those of the original injury or inflammatory change due to it. Some patients exhibited optic neuritis in the uninjured eye. Pain arising from inflammation of the sinuses was sometimes referred by the patient to his eye, and in two cases blind eyes were removed on account of severe pain, which, however, was due not to the ocular but to the nasal condition. A deep wound might involve four sinuses.

Mr. E. D. D. DAVIS based his remarks upon his experience at a casualty clearing station in France. He was struck with the frequent occurrence of a fissure fracture of the roof of the orbit in making post-mortem examinations in cases of bullet wounds in any part of the skull. Fracture of the anterior fossa was accompanied by diffuse intradural hæmorrhage, and these cases usually succumbed in 24 hours. Survival of this period was brief, for death occurred in from three to six days from basal meningitis due to infection of the cavity. He regarded early suture as very important in cases of sinus injury; it was greatly preferable to sending men to the base with flaps of tissue hanging down, or a suppurating mass covered with dressings which had become soiled with dirt. He asked for opinions as to the wisdom of draining severe orbital cellulitis through the nose. Suppuration of the antrum of nasal origin was nearly always accompanied by suppuration of other sinuses, such as the frontal or ethmoidal, but where the antral suppuration arose from the teeth, that was the only cavity involved, and no retrobulbar neuritis had been recorded in such.

Mr. H. D. GILLIES criticised Mr. Davis's plea for early suture. In such a honeycomb as was presented by the sinuses, one could not excise the whole wound, and by doing early suture, trouble was being laid up for later stages of treatment. Excision of the wound in a fleshy part was quite justifiable, but in the sinus region it was not possible. In the next (Bolshevik) war the best course would be found to be to keep the entrance wound and the exit wound as much open as possible, so that efficient drainage could be carried out, from both the external and the internal aspects. To ensure this skin should be sewn to mucous membrane, the wound being kept open until no question of suppuration remained. He hoped much from coöperation of various specialties; its value had been well shown in the mutual work of the dental and plastic surgeons.

Mr. D. LEIGHTON DAVIES confined his remarks to the effects of nasal sinus affections on the field of vision and on the ocular muscles. He was sure some cases of heterophoria were secondary to sinus affection. A complaint directed to the visual fields was not usual in patients, therefore they should always be examined and studied. He had never yet met with a case of chronic nasal suppuration which did not show some changes in the visual fields, though they might not necessarily be gross ones. There might be enlargement of the blind spot or scotomata of various types. The latter he had found only when the vision was definitely impaired. Enlargement of the blind spot he regarded as an important indication of sinus disease. After operation on the latter the blind spot subsided, only to enlarge again if the nasal trouble relapsed. Nasal disease he found to be nearly always accompanied by contraction of the visual field, that for colour being greater than for white. Even when the field was reduced to 10° he did not find the patients complain of difficulty in orientation. When the sinus trouble had been of long duration the cure of that did not result in a complete restoration of the fields, though this was possible when the sinus disease

was acute and promptly dealt with. As to the lesion causing the changes in the fields, no single theory would fit all the cases. The idea that it was a retrobulbar neuritis might be true, but a pathological examination of the optic nerve could not be made. The discharge accompanying sinusitis passed into the stomach and set up a general toxic state, which could easily involve the eye and the optic nerve itself. If that were true, it should be possible to find contraction of visual fields in association with chronic suppuration in other parts of the body, but such he had not yet found in numbers sufficient to warrant any general conclusion. Cases which supported the idea, however, were in patients suffering from chronic suppurative osteo-myelitis, chronic otorrhœa, and leucorrhœa with endometritis.

The debate was adjourned to April 10th.

THE CHILD STUDY SOCIETY.

Home v. *Institutional Training of Young Children.*

A MEETING of this society was held at the Royal Sanitary Institute on April 3rd.

Sir JOHN COCKBURN, who presided, said that Plato had advocated the taking of children from their parents and placing them under the care of the State. Most people, however, still held that the care and education of children was the duty of the parents. However efficient an agent acting on behalf of the parents might be, the influence of the parents on the children was the more important. The subject was one of the most vital for civilisation. That nation would prevail which had the sturdiest children and those best equipped for life. The utilitarian had failed because "the greatest good of the greatest number" was not Nature's last word on the matter. The well-being of the State consisted not only in providing for the present generation but also for the generation that would follow. He strongly believed in the home training of children, though many inroads on parental authority had been made by the State. Some of these were necessary, and he had heard of a parent whipping a child to cure it in the last stages of whooping-cough on the ground that this treatment had been advocated in some old medical book.

Dr. ERIC PRITCHARD, who delivered an address on Home *v.* Institutional Training of Young Children, said that there was a fairly uniform opinion among welfare societies that, splendid as had been the record of institutional treatment, no substitute had been found for the home. But it was nevertheless reasonable to enquire whether the national means adopted in this country provided the best possible conditions for building the character of its people and whether there was any alternative to the methods in use. If much depended on environment and social heredity we needed to study with care what really were the conditions—home or otherwise—under which character was best developed. Environment was a factor of such overwhelming importance in the formation of character that if it could be shown that our methods of education were susceptible of improvement, we should be right in scrapping time-honoured manners and customs, no matter what the sacrifice. From his study of the children of the well-to-do classes he believed that the domination of the nurse had much to do with the mentality of their charges. This had led him to establish training schools for the trusted custodians of the children of the upper classes, and he thought training schools might well be established for parents also. Examination of children of all classes from infancy to school age, and of their home surroundings, had convinced him that the most important factor in character formation was the mother and, in a lesser degree, the father. Housing troubles had much to do with bad training, but good houses did not necessarily make good parents. Some of the best mothers he had met lived under bad housing conditions, and some of the worst under good conditions.

Dealing with the bringing-up of children in an institution with a technically highly trained staff, the change in the child's environment was good in respect to health, disposition, and character, and he thought that it followed that there must be something radically wrong with the methods of home training in these cases. For even in seemingly hopeless cases of children suffering from some sort of physical or mental infirmity, a marked improvement was often found after only a few weeks' institutional training. With regard to mental defectives, all experience went to prove that their development in the hands of experts was superior to even expert management in the home. He had been particularly struck with the statistics of work among derelict children in such places as the Barnardo Homes, the Foundling Hospital, industrial schools, and other institutions, which, speaking generally, showed successes in 90 per cent. or even more of the children that passed through them. Good results had also been obtained from the Borstal system. The records of boys serving in the Army after passing through certified schools also bore good testimony to modern methods of education in those schools. But the fact remained that in institutional training there was something lacking which could only be provided by the individual training of home life. The chief gravamen of the charge against institutional treatment lay in its benumbing effect upon individuality. He did not wish to see the home abolished, but, rather, improved. The future of the nation and the holding together of society must depend in the last resort on the character of the people themselves. Some means must be devised for teaching parents to regard character training as of equal importance with health training, and for this purpose much could be learned from the systematic methods employed in institutions, and these methods might well be introduced into the homes of the people. Dr. Pritchard concluded by urging that in the interest of the State schools for parents were as necessary as schools for mothers.

TUBERCULOSIS SOCIETY.

Acute Pneumonic Tuberculosis.

A MEETING of this society was held on March 24th at the Royal Society of Medicine, under the presidency of Dr. HALLIDAY SUTHERLAND, when an address was given by Sir WILLIAM OSLER on "Acute Pneumonic Tuberculosis." Sir William Osler's introductory remarks dealt with some of the more interesting facts in the history of our present knowledge of tuberculosis before the discovery of the tubercle bacillus by Koch in 1882. He went on to say that the chronic forms of tuberculosis were those most frequently met with in the practice of tuberculosis officers and in general practice, and that the acute forms were found chiefly in the hospital wards. The latter included acute pneumonic phthisis, acute broncho-pneumonic phthisis, meningitis, acute peritonitis, acute miliary tuberculosis; of these the true acute lobar form was the most uncommon. Acute pneumonic phthisis or lobar pneumonic tuberculosis usually attacked adults, as opposed to the lobular form which attacked children. It was of varying activity, from the acute to the subacute types; the former being fatal in as few as 8 days, while the latter might last 3–4 months, or, in exceptional cases, become chronic and continue for many years. The disease was very fatal, the mortality being estimated at 50 per cent. Of the 23 cases collected by Sir William Osler most were adults, the youngest was 15 years, and of these 40 per cent. died. There were two possible modes of origin: the hæmatogenous and the bronchogenous, and he was inclined to give the bronchogenous method the more credit, being of the opinion that it arose from the rupture into a bronchus of either a small tuberculous cavity or a softened and broken-down lymphatic gland.

Difficulty in diagnosis arose from the fact that at the onset and for the first few days the disease was very similar to that of ordinary lobar pneumonia, for which, indeed, it was often mistaken. It began with a chill, pain in the side, friction, consolidation, rusty sputum, high fever, &c. On careful inquiry it was sometimes possible to obtain a family history or a history of prodromal symptoms, but this was not usual. After the time was passed when in ordinary pneumonia the crisis should have occurred or the temperature fallen by lysis, the fever became hectic and the sputum more of the consistency of chronic phthisis, with a green colouration and sometimes containing caseous lumps. Bacilli were not often found in the early stages, and then only after repeated examinations; in one of the cases cited they were found after 40 days. As the disease progressed weakness and emaciation were marked features. All the physical signs of pneumonia were found, but the cases showed early breaking down and cavitation. Sir William Osler had collected

specimens from the museums of Guy's Hospital, St. Bartholomew's Hospital, and the Royal College of Physicians, and photographs of these were shown upon the screen.

LONDON ASSOCIATION OF MEDICAL WOMEN.—At a meeting held on April 1st at 11, Chandos-street, Dr. Mary C. Bell in the chair, Mrs. E. E. Flemming introduced a discussion upon Medical Inspection of Secondary Schools. Speaking from her experience in inspecting girls at a boarding school and at a day school, she said that the gymnastic mistress was present in all cases, weighed and measured the girls, and made notes of any requiring special attention at drill or games. In cases of heart disease no physical exercises were allowed for the first term, games being permitted only under special supervision with no playing in matches. Consultation between the teacher and the doctor was necessary in order to do the best for the physical and mental development of the child, and Mrs. Flemming commended the practice of the head mistress or house mistress being present at the medical inspection of the scholars.—Dr. Christine Murrell said that the children under her care were weighed once a month, and it was found that the younger children did not lose weight after war rationing, but that those aged 13 to 16 showed some loss of weight. She referred to the evils of late bedtime, of the one hour's practising required of most girls, and of the amount of domestic work done by many pupils attending day schools.—Mrs. Dickinson Berry regretted the difficulty of obtaining dental treatment, especially in the case of temporary teeth. At the Grammar School which she inspected slight scoliosis, lordosis, and narrow chests were common and physical exercises were insufficient.—Mrs. Hutchison, Dr. Bell, Dr. L. Martindale, Dr. Meakin Herford, Mrs. Harry, Dr. Sheppard, Dr. Cairns Roberts, and Mrs. Agnes Swanson took part in the discussion.

MANCHESTER LITERARY AND PHILOSOPHICAL SOCIETY.—At a meeting held on March 18th, Mr. William Thomson, the President, in the chair, Professor G. Elliot Smith read a paper entitled "The Bird's Brain." It had, he said, always been an enigma that, in spite of their very scanty equipment of obvious cerebral cortex, birds should display, in their powers of tactile, visual, and acoustic discrimination, their associative memory, and their ability to learn by individual experience, outstanding evidence of functions such as are intimately associated in mammals with the activities of the cortex. The explanation of this apparent discrepancy between the morphology of the brain and the bird's aptitude to profit by experience was provided by the fact that a great part of the structure usually called "corpus striatum" was cortical in origin and in its fibre-connexions. The structures called by Edinger "hyperstriatum" (Kappers's "neostriatum") and "epistriatum" (Kappers's "archistriatum") were composed of modified cerebral cortex; and the former represented not only the neostriatum (nucleus caudatus and putamen) of the mammalian brain, but also the primordial neopallium or true cerebral cortex. The clue to the interpretation of these homologies was provided by the archaic reptilian brain that had survived in *Sphenodon*, in which was displayed with diagrammatic clearness the formation of a great cortical ingrowth into the lateral ventricle. The reason for this curious transformation was the expansion of the lateral edge of the pallium under the influence of a suddenly increased influx of sensory fibres (tactile, visual, and acoustic) from the thalamus. In virtue of the principle of neurobiotaxis (Kappers), this cortical overgrowth remained moored as near as possible to the incoming thalamic fibres, hence the development of the "dorsal ventricular ridge" (Johnston). In mammals the whole of the newly modified cortex did not become drawn into the ventricular ridge; part of it remained upon the surface, free to expand and develop into the neopallium; the rest became transformed into nucleus caudatus, putamen, and nucleus amygdalæ. But in birds the whole mass became intraventricular, and represented, not merely the neostriatum, but also the rudimentary neopallium.

MEDICAL STUDENTS AT CARDIFF.—The entry of new medical students at University College, Cardiff, has been so large that the ordinary teaching accommodation has been overtaxed, and other departments have been pressed into the medical service. At present there are about 160 medical students in training—a considerable proportion of them women—as compared with half that number before the war. One practical way that has been suggested for getting over the spatial difficulty is the holding of lectures and classes in two shifts. Only the physiological block of the new medical school has yet been erected, and this will not be ready for occupation until the beginning of next winter session, while the remaining buildings will probably take two years or more to complete.

Reviews and Notices of Books

Malaria and its Treatment: In the Line and at the Base. By A. CECIL ALPORT, M.B., Ch.B. Edin., Captain R.A.M.C. (T.), late Acting Major, Officer in Charge of Medical Division of the 28th General Hospital and of the 41st General Hospital, Salonika. London: John Bale, Sons, and Danielsson, Ltd. 1919. Pp. 280. 21*s.* net.

THE objects of this book, if we have rightly understood the author, are two-fold: (1) to advocate a particular mode of quinine administration, and (2) to aid the general practitioner in this country if and when called upon to treat malaria.

The matter of the two introductory chapters is not very fully developed, and a number of inaccuracies occur—e.g., the author states that the pupa of a mosquito "periodically goes down to the bottom to feed" (p. 4), and that "in malignant tertian malaria the parasites should be looked for just before the temperature rises; crescents, however, are more often found during the apyrexial intervals" (p. 15). Neither will the illustrations of mosquitoes nor the coloured plates of parasites bear critical examination. We regard these chapters, however, as secondary to the author's main position, which is that of an ardent clinician desiring to convert others to his way of thinking.

On p. 35 the author says: "On Oct. 20th, 1917, I introduced what I have termed the large dose intravenous and intramuscular quinine method of treating cerebral and other severe pernicious types of malaria." Figures are then given to show that the mortality while this treatment was in vogue was less than before its introduction. But before we can accept this conclusion we must try to find out what exactly the figures represent. First, out of about 4000 cases treated only about 1700 were examined for parasites and only in 643 were parasites found, so that in about 3357 cases we have no *positive* proof that they were malaria. The probability, no doubt, is that they were so, but still there is an element of uncertainty present. Secondly, in the first of the two periods parasites were found in 43 per cent. of the cases examined, while in the second period they were found only in 33 per cent. of the cases; so that the cases which the author treated (judging by the sample taken) showed less evidence of malaria than those treated in the first period; the material, therefore, in the two periods does not appear to be homogeneous as regards active infection. Thirdly, although the proportion of simple tertian to malignant tertian cases in the two periods in the samples taken is practically identical, yet as this proportion is only known for 643 out of 4000 cases we have no guarantee that the proportion holds good for the remainder of the cases (3357), assuming them to be malaria. Fourthly, the cases were not treated in the same months, another possible disturbing factor. Finally, we have no information as to what the treatment was in the first period, a rather serious omission.

Now, a quinine treatment may be: (1) inadequate; (2) adequate; (3) more than adequate. We readily grant that the author's treatment does not fall into Class 1, but we are uncertain whether it does not fall into Class 3. If we were to argue from cases in this country the treatment would fall into this last class, for we have seen records of some 3000 cases treated with doses of quinine of about 15 gr. given for about a couple of days without a death. At any rate, the general practitioner in this country may rest peaceably in his bed, for he will find that he can successfully treat his patients, be they cases of simple or malignant tertian in returned soldiers or indigenous cases, in the same way, simply being prepared to increase the doses or to give one or more intramuscular injections where serious symptoms threaten. With regard to the treatment of chronic malaria—i.e., the "cure" of relapsing cases—the method used by the author was 30 gr. daily over a period of five months through the summer and autumn (p. 136). The treatment gave "most extraordinarily good results." The context would seem to show that this statement refers to the period while treatment was in progress, and no evidence is given that the treatment was curative—i.e., that relapses did not follow when the treatment ceased.

The book appears to us to be overweighted with transcsript *in extenso* of case sheets and photographs of recovered patients, but here and there will be found a number of interesting clinical observations, more especially some precise descriptions of nervous symptoms by Colonel Purves Stewart. How far some of these symptoms—e.g., the neuralgias, are attributable directly to malaria or are simply the manifestations of intercurrent disease is, we think, an open question.

Technic of the Irrigation Treatment of Wounds by the Carrel Method. By J. DUMAS and ANNE CARREL. Authorised translation by ADRIAN V. S. LAMBERT, M.D. With an introduction by W. W. KEEN, M.D., LL.D., F.R.C.S. (Hon.) London: William Heinemann (Medical Books) Ltd. 1918. Pp. 90. 6*s*.

THIS short and concise manual has been written by Madame Carrel primarily for the use of nurses for the purpose of affording a simple and clear description of the method of treating war wounds which has been introduced by Dr. C. Carrel. The various details of the technique are given, together with a detailed description of the apparatus used in carrying it out, the numerous explanatory illustrations of which greatly enhance the value of the book. The appendices contain instructions for the preparation of Dakin's solution (Daufresne's technique), and a description of the microscopical examination of war wounds by the Carrel method. A short glossary of French terms employed for designating the various elements of the apparatus has been added for the benefit of English-speaking readers who may be in France.

Massage as a Career for Women. By BEATRICE M. GOODALL-COPESTAKE, Examiner to the Incorporated Society of Trained Masseuses, Teacher of Massage and Swedish Remedial Exercises to the Nursing Staff of the London Hospital. London: George Newnes, Ltd. Pp. 28. 9*d*.

THIS is a small but useful booklet, which would prove of great value to anyone who thinks of taking up massage as a profession. The general training is described and the various points to be considered in the choice of a training school are discussed. The cost of training is fully given, together with a list of the training schools for massage and remedial gymnastics in London, the provinces, Scotland, and Ireland. An account is given of the Incorporated Society of Trained Masseuses, a syllabus is included for students preparing for the examination in massage, and for the examination in Swedish remedial gymnastics, together with all details about the examinations. The last chapter describes massage in military hospitals, the Royal Naval Massage Service and private practice, and information is given concerning salary, fees, and possible income.

Recent Advances in Organic Chemistry. Third edition. 1918. Pp. 350. 14*s*.

Recent Advances in Physical and Inorganic Chemistry. By ALFRED W. STEWART, D.Sc. Third edition. London: Longmans, Green, and Co. 1919. Pp. 284. 12*s*. 6*d*.

THE position of useful studies at the present time in the fields of research, indicated by the titles of these volumes, is admirably stated, and the work of investigation during the past two decades leading up to this position is carefully reviewed and estimated. In the preface of both volumes the author makes a curious political reference. Thus, in the volume on organic chemistry, he writes: "It is possible that readers may detect a certain bias against the flood of synthetic material which pours chiefly from the German laboratories. Lest this should be attributed to a reconsideration of the value of German science in the light of the war, it may be mentioned that exactly the same views were expressed in earlier editions; I have no reason to modify my opinions on the subject." In the second volume he writes: "Some readers may detect in the following pages a certain distaste for physical chemistry of the kind 'Made in Germany.' Lest this should be ascribed to a revision of values consequent upon the war, it may be pointed out that exactly similar views, not too obscurely worded, are to be found in previous editions. I have seen no reason to revise my opinions on this subject since 1909, when the first edition was published." To do Professor Stewart justice we can find no prejudice in the matter; he is dealing with facts. The German chemists have undoubtedly overdone the synthetic business, doubtless for purposes of their own, and less for real scientific advance, than for exploiting commercial propositions. Hence, as Professor J. Norman Collie puts it in an introduction, organic chemistry has become a vast heap of puzzling and bewildering compounds, of which the sanguine chemist expresses a hope that some day perhaps a few of these may be useful. But the game of permutations and combinations goes on, and we suggest that a pack of cards can give similar studies, opportunities, and results.

Both books are written with marked lucidity, and students of the various subjects will be glad to have such clear résumés available for reliable reference, and to be acquainted with a critical treatment of modern developments by a competent judge. The subject matters are of deep interest, especially in view of the dawn of new industries which is anticipated in this country, and which we trust will be marked with a determination to enlist scientific knowledge more and more in the national service. Medicine will not lose by such a consummation.

Memorandum on the Industrial Situation After the War: The Garton Foundation. Revised edition. London: Harrison and Sons. 1919. Pp. 176. 2*s*.

THIS memorandum is the work of a group of men of varied views who came together, at the instance of the Garton Foundation, to discuss the industrial situation likely to arise in this country at the close of the war. An endeavour was made to analyse the more permanent causes of industrial friction and inefficiency, and to seek the means by which these causes might be removed. At first circulated privately (1916), the memorandum now appears in revised form, embodying many of the criticisms and suggestions which have been made upon it. The concluding paragraph contains the sentence: "Any genuine renaissance of industrial life must depend upon the permeation of industry as a whole by the idea of coöperation for public service as the dominant motive of industrial activity." This spirit is familiar enough to the disciples of medicine, who can appreciate better than many others what its application to industry would achieve.

A Text-book of Sex Education for Parents and Teachers. By WALTER M. GALLICHAN. London: T. Werner Laurie, Ltd. 1919. Pp. 216. 6*s*.

PARENTS are gradually beginning to realise that it is one of their duties, and perhaps one of the most difficult of them, to give their children a sex education from the moral, hygienic, and scientific standpoints. The trouble in many cases is that they know so little about the subject themselves, having been brought up in "innocence," and having been enlightened probably by those who were as ignorant as themselves. The earliest lessons on the subject of reproduction will have to be given by the mother, the later ones by both parents and teachers, and it is to afford them the help they so greatly need that the author has written this book. However much his readers may disagree with him as to the all-pervasiveness of the sex impulse in young children, they will agree that he presents a strong case for the need for sex teaching. Much of the sexual evil which exists is due to wrong teaching or lack of any teaching during the period of youthful curiosity, from which arises a spirit of inquiry, born of the mystery with which the whole subject is surrounded. As he says, "children reared with a healthy knowledge of sex matters do not develop a taste for conversational improprieties and vulgarity. The effort of total suppression frequently, if not in all cases, results in a prurient as opposed to a wholesome curiosity; ..... science has the key to purity of thought and behaviour." After a general survey of the subject the method of teaching is considered, and forms of instruction are given for young children, and for adolescent boys and girls, in the form of lessons which are indications and suggestions for the parent or teacher rather than a set course. With regard to the teaching for adolescent girls, rather too much stress is laid on the sex aspect of development. It is better for a girl to be taught what is necessary for her to know in as scientific a manner as possible than to have all her physical and mental developmental changes referred to sex; the normal active mind hardly thinks about these things at all. A good deal of

sentimentality with regard to the teaching of girls might be omitted. The chapter on sexual hygiene in childhood and youth contains much valuable information. Part III., in which the educational factors are considered, sets forth a great deal of knowledge which parents require, the chapters on home training and the school being particularly useful. If there were any doubt as to the need for sex education, Part IV. would serve to dispel it.

Experimental Education. By R. R. RUSK, M.A., Ph.D. London: Longmans, Green, and Co. 1919. Pp. 346. 7*s.* 6*d.*

THIS, the third, edition of Dr. Rusk's work has been considerably improved by the incorporation of the most recent applications of psychology to education. It constitutes a valuable and concise encyclopædia of the more important contributions, and it differs from similar American and German books on the subject in giving due weight and consideration to the excellent, if relatively small, product of British investigations. The book includes chapters devoted to the experimental psychology of children's attention, sense perception, memory, thinking, individual mental differences, learning, reading, writing, spelling, and arithmetic. The author is to be congratulated on the accomplishment of a very difficult task, that of embodying a vast amount of published data and of dealing judiciously with the conflicting conclusions which are inevitable in so youthful a branch of applied science.

Babies in Peril, or Mother and Infant Welfare Centres. By EDITH M. BENNETT, formerly Superintendent of the St. Pancras School for Mothers. Reprinted from *Maternity and Child Welfare*, November, 1918. London: John Bale, Sons, and Danielsson, Ltd. Pp. 45. 6*d.*

THIS small book is essentially practical, and Miss Bennett has a very intimate knowledge of the poorer classes and their needs. The unnecessary waste of infant life in our industrial towns may, she thinks, be ascribed to poverty, alcoholism, and overcrowding, and to the incompetence of the women as mothers and housewives. Writing of the wives of the mass of unskilled labour which lives in our poorest London districts, she says: "Of this class I have no hesitation in affirming that root evils responsible for much of the ill-habit of mind and body which prevails among both parents and offspring are a traditional malpractice in the treatment of their infants, their ignorance of ordinary hygiene, and their incompetence in other matters relating to domestic life." All will agree with Miss Bennett that the primary duty of the School for Mothers is to teach mothercraft, but the urgent need for ante-natal medical supervision is no less necessary. If the mothers become neurotic about themselves it is the fault of those who are dealing with them and not of the method. It is surely a counsel of perfection that mothers should be referred to the hospital or to their doctor for every small ailment. They cannot afford time for the one or money for the other. The ideal centre is described, and a full account is given of the staff required, the routine of the work, home visiting, dinners for mothers, the dental clinic, and class teaching. This little book should be in the hands of those who think of starting a School for Mothers or who intend to take up the work seriously.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

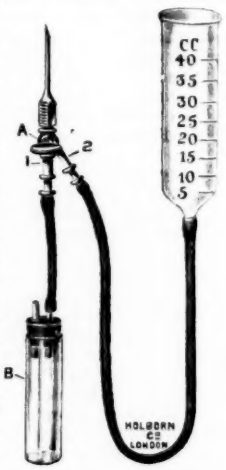
A MEETING of the Executive Committee of this Fund was held at the offices of THE LANCET on Wednesday, April 2nd, when the Treasurer announced that since the last meeting certain subscriptions had come in, notably a contribution of £500 from the South Australian Belgian Relief Fund, received through the Agent-General for South Australia. He pointed out also that when at the last meeting his statement showed a balance of £91 16*s.* 6*d.* to be remaining in hand, there was also to the credit of the Fund an additional £200, the monthly subsidy from the American Red Cross, though the sum had not at that time passed through the hands of the bank. The Fund therefore, he said, stands at the present moment at £799 in credit. It was decided by the Committee to send to Belgium at once £700 in view of Dr. Pechère's statement recently published in the medical and pharmaceutical press, stating that help is still badly needed. A grant of £20 was also made to a Belgian doctor who has throughout the war been doing good service at a war hospital and who required the assistance on his return to Belgium.

The CHAIRMAN then, in the name of the Committee, presented Miss H. de L. Brock with a travelling clock as a personal gift from the Committee and in some slight recognition of the great value of her services to the Fund.

New Inventions.

A NEW "606" APPARATUS.

THIS tap is especially adapted for the treatment of syphilis in civilian clinics where it is hard enough to persuade the patients to submit to the necessary treatment let alone the pricks that would be required for taking blood specimens. The tap (A) is constructed so that it can be turned to three positions: (1) When the handle is pointing to branch 1, the channel is open from the needle to the blood collecting tube B; (2) When pointing to branch 2, the channel is open from the saline funnel to the needle; (3) When turned vertically, as in the illustration, it is off altogether. The procedure is as follows: Branch 2 of tap A is connected by tubing &c., to the funnel of a gravity "606" apparatus filled with saline. Branch 1 is connected up to a blood collecting test tube. The handle of the tap is placed in the position 1 and the channel is then open from the nozzle to blood collecting tube. The needle is plugged on to the nozzle. The needle is then inserted into the vein and at once there is a flow of blood into the collecting tube. The handle of the tap is then turned to position 2, the channel is open to saline, at once the blood stops flowing into collecting tube and saline flows into the vein. Collecting tube B is now detached from branch 1, and in its place is put the record syringe containing the neosalvarsan, if such is to be administered. The stopcock is turned back to position 1 and the piston of the syringe pressed home. The stopcock is turned back to position 2 to let a little saline through the needle before turning it to a vertical position (complete closure of channel) for withdrawal of the needle from the vein. If salvarsan or other preparation of large dilution is given it is easier for branch 2 to be connected with the ordinary double apparatus. The advantages of the apparatus are: (1) A specimen of blood is taken before giving the drug for Wassermann reaction purposes, if required, without any extra inconvenience to the patient; (2) the operator is certain of being in the vein before giving the drug, thus avoiding any risk of subcutaneous leakages (both 1 and 2 are important with patients whose veins are difficult to find); (3) there being only one channel inside the tap, it can be thoroughly sterilised by syringing a little alcohol through it, followed by sterile saline from the container, thus removing all traces of blood, &c.—the apparatus is then quite ready for the next operation, it only being necessary to affix a new needle and blood collecting tube and re-charge the record syringe.



A. F. WRIGHT,
Captain, Royal Army Medical Corps.

Lichfield.

LEEDS WORKPEOPLE'S HOSPITAL FUND.—The late Mr. Archibald Ramsden's gift of £1000 to promote the establishment of a convalescent home for children has been handed to the Leeds Workpeople's Hospital Fund, established by Mr. F. R. Spark in 1887. During its existence the fund has collected, mainly in weekly pence, over £341,000, by which the Leeds Infirmary has benefited to the extent of over £150,000.

THE LANCET.

LONDON: SATURDAY, APRIL 12, 1919.

The Special Clinical Meeting of the British Medical Association: War Neuroses.

THE Special Clinical Meeting of the British Medical Association, replacing the usual annual meeting in August, began its session on Tuesday last, when an opening entertainment, arranged by the Metropolitan Counties Branch of the Association, with permission of the Lord Mayor of London, was held at the Guildhall. On the following evening a reception was given at the Royal Society of Medicine, and yesterday, Thursday, the dinner of the Association took place at the Connaught Rooms, Great Queen-street, W.C. The meetings of the sections, which began on Wednesday, are being held at the Imperial College of Science and Technology, South Kensington, which has been placed at the disposal of the Association by the Rector, Sir ALFRED KEOGH. The Sections sat on Wednesday, Thursday, and (to-day) Friday, and, as will have been suggested by the programme which we have already published, thoroughly interesting discussions have taken place, centralising round the pathology of the Great War.

The proceedings in the Sections of Medicine, Surgery, and Preventive Medicine respectively on Wednesday morning indicate very well the practical and inclusive nature of the discussions, for while to the Section of Medicine Colonel F. W. MOTT was describing war neuroses, Colonel T. R. ELLIOTT and Colonel G. E. GASK were addressing the Section of Surgery upon gunshot wounds of the chest, and Colonel L. S. DUDGEON and Professor W. YORKE were introducing a discussion upon the bacillary and amœbic dysenteries. Excluding trench fever, dysentery and gunshot wounds have been, of course, the greatest source of sickness and injury throughout the war. The number of their victims has been immense, yet, roughly, it has been ascertainable; but the victims of war neuroses form a category of disease whose size cannot be estimated and whose actuality can hardly be defined in terms of universal acceptance. In no previous war have such a vast number of men been disabled by functional nervous diseases, and in 1917 it was calculated that one-third of the unwounded discharges, or one-seventh of the total discharges including the wounded, were found permanently unfit on this account. For this reason Colonel MOTT'S introduction of the subject of war neuroses to the Section of Medicine was one of the most widely important communications made to the Special Clinical Meeting. Dr. MOTT referred the sinister percentage of war neuroses partly to the unprecedented exposure of the armies to the physical effects of high explosives, poison gas, and the modern developments of scientific barbarism; and partly to the conditions of trench warfare where in the first half of the war the men were unrelieved for long stretches. The fatigue and the emotional shock—now one, now the other, and now both—played their inevitable part. He also added that the British conscript Army included a high percentage of men with a neuropathic predisposition whose breakdown in certain directions was, or could have been, foreseen. Quite early in his experience at the Neurological Section of the 4th London General Hospital he found that the cases of war neuroses, under which the unfortunately named "shell-shock cases" are included, had frequently an inborn or acquired disposition to emotivity, a conclusion arrived at also by French and German authorities. It emerged in every word of Dr. MOTT'S address that there is no new nervous disease in war neuroses. It is the same hysteria and neurasthenia which neurologists knew before the war; and if hysteria and neurasthenia proved to be common in conscripts, the process of conscription or the drafting for general service might be expected to produce a crisis. This can be well understood, but Dr. MOTT narrated also illustrative cases of severe shock inducing hysterical manifestations in neuropotentially sound individuals, and pointed out that the instincts connected with the emotions of fear and anger are very important in connexion with such cases, but that the herd instinct is equally so, the morale in a regiment being generally dependent upon instinctive suggestibility. This, of course, has long been recognised by those who have had the training of armies, and the more their work in this direction has been wide and sympathetic, the more they have resented that glib criticism of their efforts which we have heard during the past four years on all sides. Of properly ordered military training the minutiæ of regulations form but a small part; attention to some of the critics would lead to the belief that the minutiæ in themselves comprised both military discipline and military knowledge, and to the view that the absence of shell shock from crack regiments was due solely to the details of drill.

The Special Clinical Meeting of the British Medical Association has afforded an excellent opportunity for all classes of medical workers during the war to compare and collate their information. In every clinic and under all sorts of conditions common manifestations of disease have occurred, and efforts have been made by physicians, surgeons, and sanitarians to combat these manifestations in accordance alike with the special pathological features and with the material opportunities present or absent. The discussions have been accordingly of a practical nature, and from them we may obtain, at this comparatively early date, rough but just verdicts with regard to the big therapeutic problems introduced by the war, as we have obtained from Dr. MOTT working hypotheses accounting for the causation and incidence of war neuroses. The medical history of the war cannot be published in detail for some time, but we know now that the world will learn many valuable lessons from many terrible experiences, and the Special Clinical Meeting has given us an advanced glance in each direction.

Medical Evidence and Trials in Camera.

AT the close of a recent trial for incest, held at the Old Bailey, Mr. Justice DARLING made some valuable observations upon the disadvantages attaching to the hearing of criminal charges *in camerâ*. Incest was made an offence punishable with penal servitude in 1908, but, owing to a section in the Act which orders all proceedings under it to be held *in camerâ*, even the fact that the offence is punishable by law is not universally known. To a certain extent, therefore, any deterrent effect that the Act might otherwise have is lost, and Mr. Justice DARLING stated on the occasion referred to that many of the prisoners who had been tried before him for incest had declared that they did not know that they had committed a crime. We need have little sympathy with a special manifestation of bestial lust, while upholding the general principle that a person who is legally assumed to know the law of his country should have the usual means of acquiring such knowledge. Mr. Justice DARLING further called attention to the fact that, as a rule, no reference to trials for incest is made in newspaper reports. This may be a hardship affecting the accused person from the fact that no publicity is given to an acquittal, such as not infrequently takes place, and indeed had taken place in one of two cases which Mr. Justice DARLING had just tried. In the light of his experience of these cases, which he pronounced to be more common than was usually believed, Mr. Justice DARLING expressed the opinion that trials for incest should be given the same degree of publicity that is accorded to others in which carnal knowledge of women constitutes the offence; though, of course, the additional fact of the near relationship mentioned in the Act has to be proved.

We are inclined to agree with the learned judge for reasons which he did not allege, but which certainly support his views. A trial *in camerâ* is beyond question a variation from the general law of our country; and none should be denied, if it be avoidable, the means of knowing either that a certain law exists, or that a person accused of a loathsome crime has secured acquittal or has been convicted. The fact that a man has been charged of a criminal offence is not unlikely to be made widely known by the personal gossip of his neighbours; his acquittal should certainly receive equal notoriety. Only this week a shameful charge against an officer broke down completely at the Central Criminal Court. The accused was acquitted at once by a jury which did not leave the box, and the judge publicly and cordially approved the verdict. If this case had been heard *in camerâ* acquittal would not have had a tithe of its power to remove stigma completely. The further point which strikes us as being of importance is that the position of witnesses in a trial *in camerâ* differs from that in which the proceedings are in public. The nature of their evidence and even the fact that they have been witnesses will be known by few besides themselves, if indeed by anyone not directly connected with the case. In the matter of a trial for incest this may seem preferable for lay witnesses, particularly to those nearly related to the accused; but medical evidence constitutes an important factor in trials arising out of unlawful sexual intercourse, and medical evidence would be prejudiced. It is quite possible that some medical witnesses would prefer a hearing *in camerâ*, and the absence of their names from public reports of incest charges. The trial may directly affect a family which they have attended professionally, and to give evidence for or against a member of it may become an onerous and anxious duty. It would then be natural for medical witnesses to prefer the absence of all persons from the court who are not compelled to be there. But publicity is certain to maintain a higher standard of professional evidence than will ever obtain under the cover of secrecy. Publicity is likely to deter the man whose standard of professional honour is not high from making statements the weak points in which his medical colleagues would readily detect. Publicity also renders it dangerous for the unqualified person to give evidence in the character of a member of the medical profession. A witness has to submit to cross-examination, and a medical man would generally prefer in any contested case that his testimony should be sifted in public, so that it can be freely discussed if not published afterwards, when his medical colleagues will have the opportunity of endorsing its correctness. The quack desires no such close scrutiny of his opinions and their foundations.

Medical evidence has before now been misinterpreted and misapplied in a court of law, and just appreciation of its significance has at times only been made possible through publicity. The trial of the STAUNTONS in what was known as the "Penge Mystery" is a classical instance of the advantage of publicity. If this case had been heard *in camerâ* the letter of Dr. J. HARMAN to the *Daily Telegraph*, pointing out that the victim might have died of tuberculosis; the exhaustive "Remarks on the Medical Evidence in the Staunton Case" sent by Dr. W. S. GREENFIELD to THE LANCET; the letters of CHARLES READE in the *Daily Telegraph;* and our own leading article, practically upsetting the verdict, would never have appeared. All the correspondence and agitation which had as their object and result the prevention of a miscarriage of justice would have been impossible, and at least two out of four persons, three of whom had been undoubtedly guilty of gross cruelty but not of murder, would have been hanged. The summing up of Mr. Justice HAWKINS would have escaped public comment, and if we recall only this feature of a well-known trial we at once see the undesirability of allowing any kind of judicial proceeding to take place unnecessarily in secret. The same errors that characterised the trial of the STAUNTONS for murder might characterise any secret trial for incest, and the fact that in the Divorce Court cases involving the question of nullity of marriage are decided *in camerâ* is outside the argument, for there is no question of a public wrong or of a heavy penalty involved. Formerly these cases were dealt with in the Ecclesiastical Courts, which dealt also with incest as an offence against morals. To this former jurisdiction of the Ecclesiastical Courts over cases of incest, and to their practice of hearing such cases *in camerâ*, Mr. Justice DARLING, with his usual learning and acuteness, attributed the attaching of a condition of privacy to the trial of the newly-constituted crime.

Sanitation in the Near East.

THE extraordinarily interesting part of the world's crust lying between the Mediterranean and Caspian Seas and the head of the Persian Gulf has, along with the Balkan peninsula, become vastly more familiar to us in many different aspects during the last four or five years. Some of the glamour doubtless has been lost. A generation ago many otherwise well-informed people knew of the inhabitants as curious folk living on sour milk-curds, taking with immunity and apparent enjoyment large quantities of white arsenic, the men gratifying their taste for racial feuds and tobacco, while their women performed the other civic duties. But the diseases of the same region have been famed from time immemorial, and most of us are familiar with the episode in the life of a nomadic people in which their historian attributes a deliverance from captivity to a series of plagues which fell on their oppressors. Thus, three of these plagues, 4000 years ago, were ascribed to locusts, lice, and flies respectively. Time counts for little with epidemic disease, and these unamiable insects still occupy a chief place in the sanitary picture of the area, although now regarded rather as carriers of disease than as the actual morbific agents. Modern camp sanitation is largely the record of their successful conquest, a story which has been told repeatedly in our columns and was resumed with abundant pictorial illustration by Dr. WILLIAM HUNTER, Colonel, A.M.S., at a recent social evening of the Royal Society of Medicine. In our present issue Dr. ANDREW BALFOUR, Lieutenant-Colonel R.A.M.C., covers the same ground in another way, describing the various hygienic expedients observed by him during a tour of inspection throughout the whole of the Eastern war area. This paper was read before the Society of Tropical Medicine, and was noteworthy for its numerous photographs, a selection of which we are able to reproduce. Dr. HUNTER'S work was principally concerned with two great epidemics of typhus and of relapsing fever, which he describes as the most extensive ever recorded in history, and which were brought under control within the course of a single month by the devising of simple methods for preventing transference of lice from person to person. The genius of preventive medicine, which performed such a miracle, consists in the devising of methods rather than in the carrying of them out. To be effective such methods must be applicable on a large scale by an immense number of ordinary fallible human beings; they must therefore be simple and popular. If difficult in execution sanitary measures would involve the constant services of a numerous and highly skilled technical staff. If unpopular they could only be carried out in the face of the enemy. As Dr. BALFOUR reminds us, necessity is here the mother of invention, and the sanitary officer has had to invent and improvise on the spur of the moment measures to meet exceptional circumstances, and he has done this with wonderful ingenuity. To the Army in general sanitation was wont to be a synonym for latrines. The Royal Army Medical Corps in the East has realised quite another conception of sanitation and has carried it into every detail of the martial and civilian life. In the fiery heat of the Mesopotamian summer the Army sanitarian made a cookhouse both cool and fly-proof, so that a cavalry regiment enjoyed tender roasts and stews: he fenced in the scanty springs and pools of a thirsty country, protecting them from pollution by pumping water out through a hose-pipe; for storing water on a small scale he used as pitchers the huge fruits of the baobab tree when German shell cases were not available for the purpose. It was in the Near East that the open air-cage fly-trap was designed and the enhanced efficacy discovered of tanglefoot fly-paper when bent in the form of an arch; it was there that dead flies were first measured in pints like shrimps, a pint being equivalent to some ten thousand corpses. Success in sanitation, Dr. BALFOUR adds parenthetically, depends largely on attention to detail; and his fascinating account of sanitary and insanitary makeshifts is a complete confirmation of this statement.

The lessons thus taught are no longer of remote or even academic interest. The glamour of the Near East has been bartered for knowledge and for experience, some of which may still have bitter fruit. The infection of dysentery has been reaching this country in increasing volume, and its importance is recognised by the devotion to its discussion of the whole morning session last Wednesday of the Section of Preventive Medicine of the British Medical Association. Dr. LEONARD DUDGEON, Colonel, A.M.S., recounted there his important investigations into the relation of bacillary dysentery to water and to flies. Dysentery bacilli were isolated by him from wild flies captured in places where the disease was endemic, while the bacilli in contaminated water retained for long periods their infective character. His researches suggest the need for further knowledge in both these directions. Professor W. YORKE called attention to the widespread infection with amœbic dysentery revealed among the home population by the recent work of J. R. MATTHEWS and A. MALINS SMITH. His own conclusion is that much of this infection is not of recent importation, but has existed undiscovered for a long time past, simply because it was not looked for. Few indigenous cases of acute amœbic dysentery have, so far, been recorded. Professor YORKE reminds us once again that all the factors necessary for the spread of dysenteric infection are to be found in this country, and this reminder should be read in conjunction with the very complete scheme for the disposal of dysentery carriers, put into force by Army Council instruction, which we print on p. 626. The measure of control which can reasonably be exercised over the freedom of a dysentery carrier is one of the many important administrative questions raised in this article. The Local Government Board has already enjoined certain measures of after-care on the individual public health authorities.

The paramount importance of this home invasion by the diseases of the Near East gives point to the plaint justly raised both by Dr. HUNTER and Dr. BALFOUR in regard to the position of hygiene in the official world. Hygiene has been called the Cinderella of the medical services. Preventive medicine, like virtue, has to complain that attention is only called to its lapses and failures. The number and degree of these failures can be fairly seen and estimated by any fool; it takes a wise man to visualise what is resisted or prevented. Decorations which play so large a part in Army life are not showered on sanitary work. The reward of the sanitarian is perhaps the greatest which can fall to any man—the knowledge that he has been instrumental in saving the lives of countless numbers of his fellow men. But if decorations have any place at all sanitary science should receive its due.

Annotations.

"Ne quid nimis."

SYMBIOSIS.

THE problem of symbiosis is one of the many interesting bacteriological questions which have assumed a position of importance during the last few years. Indirectly, if not directly, the subject has been raised in our columns on more than one occasion recently in dealing with war time diseases such as gas gangrene, with its mixed anaerobic flora, and typhus fever; while the two communications on influenza and diphtheria, one by Dr. Evelyn Constable, which appeared in our pages last week, and the other by Mr. Robert Nairn, on page 635 of the present issue, raise the same question in different form. The fact that widely differing species of bacteria can flourish together on an agar or gelatin plate or in fluid media has, of course, been obvious since the very early days of bacteriology, but the precise conditions of symbiotic existence still remain obscure. Indeed, the name itself probably covers a number of different phases of bacterial growth. Should it be confined to a condition in which the growth of one organism is essential to the growth of another? Or should the term symbiosis refer to all conditions of living together, both conditions which are mutually helpful and conditions antagonistic? Is it a "harmonious living together with a minimal disturbance to the host," as Adami believes it to be in the case of the metazoan parasites, or is it a condition which tends to the production of more serious disease?

During the early years of bacteriological research we were busily engaged in obtaining pure cultures, in studying morphological differences for the purposes of classification—in short, we were working out the problem of the identity of disease which Sir William Jenner put before medicine in his papers on fevers. Of late years the study of bacteriology has taken on a new aspect. We spend our days in the laboratory at the present time in investigating toxins and analysing the biochemical properties of our cultures, and these subjects are leading us back again to symbiosis. Several interesting facts have emerged from this line of research. Coley has shown that the streptococcus is more active when combined with *B. prodigiosus* and has made practical use of the fact in his fluid. According to Neisser and others, Pfeiffer's influenza bacillus flourishes best under symbiotic conditions, and the influenza vaccine now in use is frequently a vaccine of mixed cultures. In the case of the acid-fast bacilli, again, Twort has succeeded in growing Johne's bacillus by combining with his culture media the dead bodies of timothy-grass bacilli. The underlying principle of this method of cultivation opens up large possibilities, and we shall be interested to see the results of the application of this method not only to the growth of organisms such as *B. lepræ*, which have hitherto presented such great difficulties in cultivation, but also to the production of bacterial antigens.

It would be pure speculation at this stage to enter upon the discussion of the connexion between symbiosis and pleomorphism, involution forms, spore formation, and the accidental association of organisms. The part symbiosis plays in diseases of the skin, of the external genitals, of the mouth, and of the intestines—indeed, of all regions where a mixed bacterial flora is the rule—still awaits investigation and solution.

A STUDY IN PROPAGANDA.

A GOOD deal of publicity has lately been given in this country to the subject of venereal disease, and there are indications of similar activity across the Channel. As an example of the methods employed there we may instance *Les Confidences d'un Tréponème pâle*,[1] in which Dr. Maurice Boigey adopts the artifice of stating his case through the mouth (if we may be permitted the expression) of the organism associated with syphilis, which is personified as a monster gloating over its powers of evil. If a scheme of propaganda is justified by its effectiveness the book before us may claim a considerable measure of success, for it is calculated to hold the attention of the lay reader, and under a mask of frivolity there may be detected an earnest intent to cope with a social peril. In the main the volume is made up of accounts of illustrative cases treated from historical and psychological standpoints, though it is marred by a certain extravagance of statement which detracts from its value as evidence. Thus selections from what purports to be the journal of a painter lead up to the proposition that the syphilitic virus "gives rise to the obsessions whence issue realism, pornography, symbolism, cubism, and diabolism." One need not take too seriously the suggestion that the turmoil of the war years may be traced ultimately to the fact that Friedrich Nietzsche was the victim of congenital infection, and while some psychiatrists may chuckle over the treponeme's claim to have "created the sect of psycho-analysts," it is not likely to receive wide acceptance. As regards questions of prophylaxis and treatment the author has little that is novel to say, but it would appear that he attaches no great importance to the employment of calomel ointment. Although his attitude towards his subject is unfamiliar to British minds, his book may afford useful hints to medical officers of health and others engaged in the work of protecting the public.

DYSENTERY IN GERMANY IN 1918.

BACILLARY dysentery was epidemic during the year 1917 in many parts of Germany, and especially in Prussia. Among the towns that suffered most were Berlin, Essen, Leipsic, and Dusseldorf. With the advent of winter the prevalence subsided, but it did not cease entirely, for cases and deaths continued to be reported every week during the winter months as well as during the spring and summer of 1918. The recrudescence of 1918 became evident early in August, and from that time up to the end of October, a period of three months, 20,648 cases were officially reported in Prussia alone, of which 2157, or a little over 10 per cent., died. In this epidemic the infection extended to the eastern as well as the western districts of Germany and affected both the military and civil populations. Among the German towns outside Prussia that suffered most severely in 1918 were Hamburg, Hesse, and Stuttgart. During the autumn of 1918 the disease was also epidemic in Austria-Hungary, affecting chiefly the cities of Vienna and Budapest and in a less degree Prague and Lemberg. By some German authorities the outbreaks of

[1] Payot et Cie, Paris.

dysentery during the war have been attributed mainly to dietetic factors combined with the usual climatic factors of the autumn season. Other experts ascribe the recent outbreak to the bad effects of the war food, especially the kind of bread that was distributed. According to Strauss, of Berlin, the spread of dysentery is related to war conditions in two ways—namely: (1) through the numerous carriers of infection who returned home from the war zones and handed on the disease to others, and (2) the state of diminished resistance among the population arising from malnutrition and irritation of the alimentary canal by coarse articles of food. Owing to the food scarcity in Germany many people were driven to consume stale or even decomposing food, sometimes with disastrous results. The possibility that bacillary dysentery may be brought back from the war zones to this country by demobilised soldiers must not be lost sight of, since if introduced unrecognised in this way dysentery is not unlikely to spread, especially in insanitary districts and among persons of careless and uncleanly habits. We publish in another column an article upon the scheme recently issued by the War Office for treatment and disposal of convalescents from dysentery, where the carrier is considered as a potential source of infection.

THE INSTABILITY OF THE VITAMINES.

THERE is much valuable work going on at the Lister Institute on interesting dietetic problems, if we may judge from the December (1918) number, recently published, of the *Bio-chemical Journal*. This number includes a paper on "Accessory Factors in the Nutrition of the Rat," by A. Harden and S. S. Zilva; a paper on "The Antiscorbutic Value of Cabbage (Raw and Heated)," by Ellen Marion Delf, with an appendix by Frances Mary Tozer; and a farther paper on "The Effect of Drying Cabbage," by E. M. Delf and Ruth Filby Skelton. The importance of fat soluble A comes out in the experimental investigation of rat nutrition, inasmuch as it is shown that an antiscorbutic does not fulfil the physiological function of fat soluble A when the former replaces the latter in the diet. The authors confirm the observation of McCollum and his colleagues, and of Drummond, that by depriving rats of the antineuritic factor a dietetic deficiency is brought about, as a result of which neuritic lesions are produced, and a fatal termination ensues if the diet is not rectified in time. Finally, rats subsisting on a diet containing the antiscorbutic plus the water and fat soluble A factors grow better than rats from the diet of which the antiscorbutic factor is absent. Whatever the chemistry of the vitamines may prove to be, it is evident that they are unstable molecules, and this fact is of considerable importance in connexion with the correct preparation of food. Thus while a very small amount of raw cabbage daily is sufficient to protect from symptoms of scurvy, when added to a basal diet, the antiscorbutic factor was found by Delf to be exceedingly sensitive to temperatures below 100° C., 70 per cent., for example, of the original value being lost after one hour's heating at 60° and over 90 per cent. after the same period at 90°. After 20 minutes heating at 90° or 100° the loss was estimated at about 70 per cent.—i.e., the same as after 60 minutes at 60°—so that the rate of destruction of the vitamine is increased only about threefold for an increase in temperature of 30° to 40°. This fact would appear to discount the view that heat denaturation of a protein-like or enzyme-like body is here in question. The practical conclusion is that, if the antiscorbutic factor is to be preserved, the cooking of vegetables should be quickly done at a higher temperature rather than slowly done at a lower temperature, and they should be steamed rather than boiled, and the addition of either acid or alkali is ruled out. The stability at high temperatures and instability at relatively low temperatures are peculiar, and according to the same author, in collaboration with R. F. Skelton, there is a loss in antiscorbutic properties of more than 93 per cent. when cabbage is dried at a low temperature and stored subsequently for a few weeks at room temperature. The loss increases with further storage, and eventually antiscorbutic activity disappears. A similar loss occurs also with the fat soluble growth-promoting factor. The obvious deduction is that the preservation of vegetables by drying is an unprofitable process, having regard (1) to the labour and fuel involved, (2) to the low nutritive and antiscorbutic value of the product, and (3) to the subsequent deterioration on storage. These results raise important questions in regard to dried milk, particularly as in one case the dry product is obtained instantaneously at a temperature above 100° direct from the milk without concentration, and in the other by a preliminary process of condensing and subsequently spraying into a warm current of air. If milk behaves like fresh cabbage, we should expect the vitamines to be retained in the former case, but a deterioration in the latter. It is interesting to note, however, that the enzymes are destroyed by the hot, rapid process, while they are preserved in an active state in the spray-produced powder.

PRIMARY PNEUMOCOCCIC MENINGITIS.

PNEUMOCOCCIC meningitis as a primary condition is very rare. In the *Medical Journal of Australia* Dr. G. H. Burnell has reported two cases. A boy, aged 5½ years, was admitted to hospital on Oct. 3rd, 1918. He became ill on Sept. 30th with aching of the top of the head, and had screaming fits during the night. On Oct. 1st he vomited several times. On the 2nd he became delirious and very restless. On admission he was extremely restless, and there was photophobia. The temperature was 100·9° F., pulse 120, and respirations 42. There was definite rigidity of the neck. No signs of pulmonary disease were present. The knee-jerks were active and Kernig's sign was well marked. Lumbar puncture yielded 20 c.cm. of slightly turbid fluid with a greenish tinge, not under pressure. On the probable diagnosis of meningococcal meningitis 15 c.cm. of antimeningococcal serum were injected into the spinal theca and 10 c.cm. subcutaneously. A cell count of the spinal fluid showed 280 per c.mm., mostly lymphocytes. Myriads of organisms were observed in the spinal fluid. Stained films and cultures on blood agar showed these to be pneumococci. This proved the case to be pneumococcic meningitis. The lungs were again examined with negative result. He became steadily worse and died on the following day. A necropsy was refused.

In the second case a married woman, aged 58 years, was admitted on Oct. 12th, 1918. On Oct. 9th she complained of slight headache. She had slipped and struck the right side of her head two days previously. On the 10th she vomited frequently and became delirious. She was seen by a practitioner, who found the bladder distended, catheterised her,

and diagnosed meningitis. On admission she was restless and noisy and resisted examination. The temperature was 101·8° F., pulse 104, and respirations 36. The pupils were semi-dilated and did not react to light. The neck was very rigid, but there was no retraction. The tongue was dry and brown. The chest was normal. The left knee-jerk was more active than the right and Kernig's sign was well marked. The plantar reflex was absent. A blood count showed leucocytes 18,000, of which 82 per cent. were polymorphonuclear, 11 per cent. lymphocytes, and 7 per cent. transitional. Under chloroform lumbar puncture was done, and 15 c.cm. of hazy fluid with a greenish appearance, suggesting that of the first case, were obtained. As Dr. Burnell did not wish to lose any time, he injected 30 c.cm. of antimeningococcic serum into the spinal theca and 10 c.cm. intramuscularly. The spinal fluid showed myriads of pneumococci and on blood agar a pure culture of the pneumococcus was obtained. Following the work of Lister in South Africa on the strains of pneumococci, Dr. Burnell had prepared a series of sera from pneumonia patients after their crises. On testing this strain he found a serum which agglutinated it strongly. A second puncture was done four hours after the first; the canal was washed out with warm saline solution, 15 c.cm. of the serum were injected, and at the same time 12 c.cm. subcutaneously. The temperature at this time was 105·9°. The pulse failed, and death occurred 11 hours after admission. The necropsy showed a friable but not enlarged spleen. The brain was not examined, but the spinal cord was exposed throughout its whole length. The meninges were intensely injected and the cord appeared soft. Sections showed round-celled infiltration of the pia arachnoid, with scattered hæmorrhages in the white matter of the cord. The grey matter was normal. Dr. Burnell points out that pneumococcal meningitis can be diagnosed only by microscopical examination, but a greenish tinge of the spinal fluid in a future case would make him suspicious.

THE SPIRIT OF RESEARCH.

WE dealt recently in a leading article with the characteristics of the spirit of research which should pervade all departments of medical work. An example comes to hand in Dr. W. A. White's recent book on the "Principles of Mental Hygiene," and we give it in brief, retaining the author's picturesque directness.

> A patient in a mental hospital kicks out a lot of window-lights in a paroxysm of uncontrolled irritation, cuts himself in so doing, and squabbles with his caretakers in their endeavours to restrain him. Now, if knowledge is not the ideal of the institution, how shall such a situation be dealt with? The natural way in recent years would be to give the patient a hypodermic or some powerful drug to put him to sleep. A little longer ago he would have been put in a camisole or shut up in a room by himself, the ward readjusted, the lights put back, and the patient continuing in more or less restraint for an indefinite period, from which he may gradually emerge, to repeat the same kind of procedure with the same kind of results. Now, if the ideal of knowledge is the ideal which animates this institution, what will happen? If such an outbreak is the first in the history of this patient the doctor will try to find out what it means, why did the patient smash out these window lights, was he disturbed, irritated by anybody else about him, or did the cause lie within himself? There must be some reason why the patient broke out the window lights and did not break the furniture, why he did it at that particular time, and why, as he probably did, he got relief from so doing. There is no longer any problem of whether the patient is to be roughly handled, strapped up, terrified. There is just the attitude of trying to understand.

The last six words of the quotation make not a bad definition of research.

SIR WILLIAM CROOKES.

A DISTINGUISHED chemist and physicist alike has been lost to the scientific world by the death of Sir William Crookes, which took place on April 4th in his 87th year. By his extraordinarily patient and persevering attempts to get a glimpse into the nature of things, Crookes has handed down to posterity a legacy full of promise in fields of the utmost importance in life's affairs. The spirit with which he approached scientific research was well reflected in the closing words of his memorable presidential address delivered at the annual meeting of the British Association for the Advancement of Science held in Bristol in 1898, when he said, "Steadily, unflinchingly, we strive to pierce the inmost heart of nature, from what she is to reconstruct what she has been, and to prophesy what she yet shall be. Veil after veil we have lifted, and her face grows more beautiful, august, and wonderful with every barrier that is withdrawn." A charming personality, with the gift of making clear to the child the nature and trend of his researches, Sir William Crookes possessed the affection and esteem of all his scientific colleagues. He had a peculiarly unostentatious manner, and in discussing the far-reaching results of his labours, displayed quiet, patient qualities not always characteristic of the successful man of research. He will be memorialised most in the annals of science by his work which turned on the study of the borderland between energy and matter, a field of investigation opened up by the phenomena of the electric discharge through rarefied gases. So fruitful were these researches on radiant matter that he was led to exclaim, "We have actually touched the borderland where matter and force seem to merge in one another." These researches gave to the world the Crookes tube, and placed in Roentgen's hands an instrument which he found evolved highly penetrative radiations still known as the X rays: thus X radiology was founded, which has since been of the utmost value and importance in medicine and surgery. The conception of the electron was established, that electric particle, or "protyle" as Crookes called it, forming a cluster in the atom. The theory of transmutation was revived and strengthened and, with the discovery of radium, passed into the realm of fact when it was found that radium disintegrated or suffered a degradation into other and simpler elements, helion, niton, and their congeners. Before he was led to the study of ultra-gaseous matter Crookes had already brought to light new elements, the most important of which was thallium. Such were the pains he took to isolate these that it involved months and months of laborious work by a process of fractional precipitation before products in a state of purity were obtained. Similar processes were adopted for the isolation of thorium and cerium, the incandescing oxides of which gave us the modern gas mantle. Radium itself was carried forward by similar means. Crookes was the doyen amongst analytical chemists. His last work of research, carried out only a few years ago, has a medical interest, and was recently alluded to in our columns. We refer to the lenses which he introduced, in order to cut off the ultra-violet rays from transmitted light without loss of luminosity. These lenses have proved of value in photaugiaphobia (or fear of *glare* of light), also to those obliged to work under dazzling illumination A series of such lenses was prepared, adapted to

varying conditions. Cerium, uranium, nickel, and cobalt were amongst the metals employed in the fusion of the glass to give it these light-filtering properties.

Crookes was a great man of science, and his conceptions and work taken as a whole have added to the sum of human knowledge and will produce lasting benefit to the race.

THE DOG AS TEST OBJECT.

THE Dogs Protection Bill has passed the Committee stage and is to be reported in its amended form to the House of Commons. The Bill, if it becomes law as it stands, will prohibit any experiment on dogs of a nature to cause pain or disease, whether conducted with or without anæsthetics. Sir Watson Cheyne pointed out in the Standing Committee that as a surgeon he could not afford to lose any possible source of information which might help him in his work; and Dr. Nathan Raw credited experimental work on the brains of dogs with the saving of countless lives of soldiers suffering from head wounds. As will be seen from the report of our Parliamentary Correspondent, Sir Watson Cheyne was able to put in a plea for research when the proposals for a Scottish Board of Health were being discussed. The threatened loss of the dog as a test object has brought a number of our prominent physiologists into the open in the columns of the *Times*. Sir Edward Sharpey Schafer began by stating that since physiology is the only sure basis of medicine, and is itself absolutely dependent upon the dog for knowledge to be applied to man, the passage of the Bill would be a disaster comparable to that of last year on the Western front. Professor E. H. Starling writes in the same strain that the fundamental discoveries made during the last 20 years, which have proved of such inestimable value in the treatment of wounded soldiers, were achieved in the first instance by means of experiments on dogs. His actual words are:—

> By such experiments it was first found possible to excise portions of the alimentary canal, to make openings from one part to the other in order to relieve obstruction, to implant bone or other tissues so as to restore defects, to deal fearlessly with the cavity of the chest, to sew up wounds in the living and beating heart, to restore continuity in wounded blood-vessels, and to operate with success on the brain itself.

Dr. Thomas Lewis compares the prohibition of animal experiment with an instruction to the clock repairer never to remove the case from any mechanical device resembling a clock. Dr. Leonard Hill reminds us that the passing of the Bill would prevent the completion of Dr. E. Mellanby's observations on the genesis of rickets in puppies, designed to throw light on the 50 per cent. incidence of this nutritional disorder in Glasgow children. The experiment was to consist in confining the young puppies in the stagnant air of a warm room. Professor J. N. Langley makes the point that experiments on animals afford the basis for sound treatment in animals themselves, and hints that, with further restrictions on research, physiologists, whose pecuniary reward is negligible, will be reduced to seeking other fields of less value to science and medicine. Sir Philip Magnus recounts the circumstances in which the Bill passed through Committee, where the University representatives of Oxford, Cambridge, London, and Scotland all recorded their votes against it, and where their academic position carried no weight in the issue. The limitations which are intended to be put upon medical research may bear sad fruit, when this readiness to put sentiment and sensibility ahead of sense and truth will not appear such a humane proceeding as many now consider it to be.

BRITISH SCIENCE GUILD EXHIBITION.

AN exhibition of British scientific products organised by the British Science Guild is to be held in the Central Hall, Westminster, London, S.W., from July 3rd to August 5th. The objects of the exhibition are to illustrate recent progress in British science and invention and to help the establishment and development of new British industries. The success of the exhibition held last summer at King's College, London, and that held later at the College of Technology, Manchester, has encouraged the promoters to continue the instruction of the public in such matters. The exhibits will be divided into 12 sections, the eighth being medicine and surgery, including bacteriological and X ray apparatus, in charge of a committee over which Sir James Crichton-Browne presides, and of which the members are Professor A. Keith, F.R.S., Dr. R. Knox, Dr. Flora Murray, Dr. S. Squire Sprigge, Mr. C. E. Wallis, L.D.S., and Dr. Dawson Williams. Lectures and demonstrations will be arranged during the holding of the exhibition, the organising secretary being Mr. F. S. Spiers, at 82, Victoria-street, London, S.W. 1.

THE EXHIBITS AT THE CLINICAL MEETING OF THE BRITISH MEDICAL ASSOCIATION.

THE collection of surgical instruments, drugs, and foods grouped together at this meeting on the second floor of the Imperial College of Science and Technology is proving of interest particularly in relation to the events of the war. Although the exhibition was on a comparatively small scale and the space allotted to individuals somewhat limited, medical visitors have evidently found plenty to engage their interest. In a future issue we propose to review some of the exhibits brought forward.

Sir Archibald Garrod has returned to 9, Chandos-street, Cavendish-square, after three years' service abroad as Temporary Colonel, A.M.S.

THE house and library of the Royal Society of Medicine will be closed from Thursday, April 17th, to Tuesday, April 22nd (both days inclusive), but members of the R.A.M.C. and other Medical Services will be admitted except on Good Friday and Easter Monday.

A WEEKLY programme of the Emergency Post-graduate Scheme arranged by the Fellowship of Medicine is now being issued. Additions and corrections for the ensuing week should reach the secretary of the Fellowship of Medicine at 1, Wimpole-street not later than first post on the previous Thursday morning.

Mr. Albert Carless, professor of surgery in, and senior surgeon to, King's College Hospital, has accepted the post of Medical Director to the Barnardo Homes from October next, resigning his position at King's College Hospital and other appointments in order to give his whole time to the organisation of the medical work and health problems involved.

THE DISPOSAL OF DYSENTERY CARRIERS.

THE scheme embodied in the Army Council Instruction No. 78 of 1919, recently issued by the War Office for the treatment and disposal of convalescents from dysentery, promises to provide a comprehensive and detailed means of protection alike of the individual concerned and of the general public. That such a precautionary measure in the interests of the whole community is badly needed, is obvious in view of the large number of dysentery cases and convalescents returned from the various battlefronts, many of whom as carriers are potential sources of infection, and would, unless adequately dealt with, prove foci for the outbreak of dysentery in epidemic form at home.

General Considerations.

How far the scheme ideal in theory will prove practicable time alone can show. Its successful administration is dependent on the recognition of the importance, on the one hand, of a very thorough organisation between administrative officers, medical officers in charge of patients, and the demobilisation and dispersal officers, and on the other hand, in particular, between divisional and ward medical officers *and* the bacteriologists and protozoologists employed in the laboratory in carrying out the requisite tests. Coördination between the wards and the laboratory, undoubtedly lacking in the past, cannot be too strongly emphasised to ensure success in diagnosis and treatment, and to avoid unnecessary delay in passing cured carriers on for examination by the standing medical board, and ultimate disposal by the demobilisation and dispersal officers.

In addition, the scheme will call for a close and clear understanding between medical officer and convalescent; the former will require to combine firm discipline with tactful persuasion in dealing with his patients, and the latter should be made to realise, particularly in the case of amœbic dysentery, that his prospect of cure is largely dependent on his personal coöperation and patience in submitting to a form of treatment on the whole effective, though admittedly unpleasant to some.

In both forms of dysentery the importance of exact attention to details of personal cleanliness and hygiene, the risk of relapse as the result of errors in diet and careless exposure to chill, should be fully explained, and last, but by no means least, that the object of the whole scheme is directed towards the welfare both of the individual and of the general community at large.

Description of Scheme.

It has been appointed that all patients suffering or convalescent from dysentery are to be sent to one of 12 selected hospitals distributed as follows among the various Home Commands: 2 in the Eastern, 2 in the Northern, 1 in the Scottish, 4 in the Southern, and 3 in the Western. One of the 12 selected hospitals, the Addington Park Military Hospital, has also been constituted as the central dysentery hospital.

Each of the selected hospitals will be complete units for treatment and diagnosis of dysentery, with both bacteriologist and protozoologist for the laboratory work, who should be in intimate touch with the medical officer in charge of cases and have free access to the patients and their records. On admission to a selected hospital steps are at once to be taken to verify the diagnosis of dysentery and to exclude the carrier condition.

Two negative tests at intervals of a week are laid down as the required number of examinations before the patient can be directly discharged if considered fit or transferred as a convalescent to the central dysentery hospital. In the event of a positive test, whether bacillary or amœbic, the patient will be treated for a period of three weeks, and during this time at least two further tests will be made. If the results prove negative he will then be transferred to the central hospital as a convalescent; if, however, positive tests are obtained more than three months from the original date of onset he will be classed as a chronic carrier and as such transferred to the central hospital for further observation and treatment.

The Addington Park War Hospital, near Croydon, with accommodation for 700 patients, has for the past four years been utilised under divided military and civil control as one of the home hospitals for dysentery and enteric convalescents and carriers. About 100 patients were accommodated in the main building, the former palace of the Archbishops of Canterbury, and the remainder in concreted hut buildings in the adjacent park grounds. A laboratory, well equipped and fitted with every requirement, was also installed in a separate block of hut buildings near the wards.

The whole establishment was taken over by the War Office on Jan. 1st, 1919, and together with the neighbouring Shirley Convalescent Camp is now the central dysentery hospital, and known as the Addington Park Military Hospital. It is organised in two parts, a hospital section for the treatment and observation of carriers and of severe or relapsing cases of dysentery, and a convalescent section, with a total accommodation in the two sections for 1400 to 1500 patients.

In the existing laboratory there will be three bacteriologists and three protozoologists for carrying out the necessary tests, under the supervision and control of a director. A standing medical board, including one of the laboratory staff, has been constituted for the periodic examination of all dysentery carriers and of severe or relapsing cases, the disposal of which will be regulated according to their condition.

Treatment of Carriers.

Bacillary carriers will be divided into two groups: 1. Temporary carriers are to be considered clear of infection after at least four consecutive negative tests obtained within a period of ten days. They will then be regarded as fit for discharge, for which purpose the central hospital will be the appropriate dispersal hospital. In the event of the board considering a patient unfit for discharge he may be recommended for a further period of treatment, at the end of which he will again appear before the board for disposal.

2. Chronic carriers will also be examined at intervals by the board for consideration as to disposal, and the persistence of the carrier condition will not be judged as sufficient ground to prevent discharge from the army. Exceptionally, a chronic carrier may be retained in hospital beyond six months but not as a rule beyond a year from the date of his first admission to a home hospital for dysentery, or of the symptoms attributable to dysentery.

Amœbic carriers.—In the case of uncured amœbic and also healthy amœbic carriers specific treatment, or re-treatment, is laid down as optional and not compulsory. It is here that the personality of the medical officer and the exercise of tactful persuasion will need to be directed towards securing the consent and conscientious coöperation of patients, by means of a full explanation of the nature of their condition, the strong probabilities of recovery under treatment, and without it the risk of relapses and persistence of infection. In accordance with A.C.I. 78 every "healthy" or "uncured" amœbic carrier who elects to be discharged while still a carrier will be required to sign a paper stating that his condition has been explained to him, and that he has been offered and has refused a course of specific treatment.

In the treatment of amœbic carriers bismuth emetine iodide in 3-gr. doses is administered in the form of a mixture, or in capsule, daily for 12 days.

Tests for the presence of histolytica cysts are taken, the first at an interval of 7 to 14 days after treatment, and five subsequently spread over the space of two weeks. In the event of six negative tests the patient is transferred to the convalescent section preparatory to appearing before the medical board for disposal. If the tests following the first course of treatment prove positive, a second and, if necessary, a third course is administered, after which those who are still carriers will, if otherwise fit, be discharged.

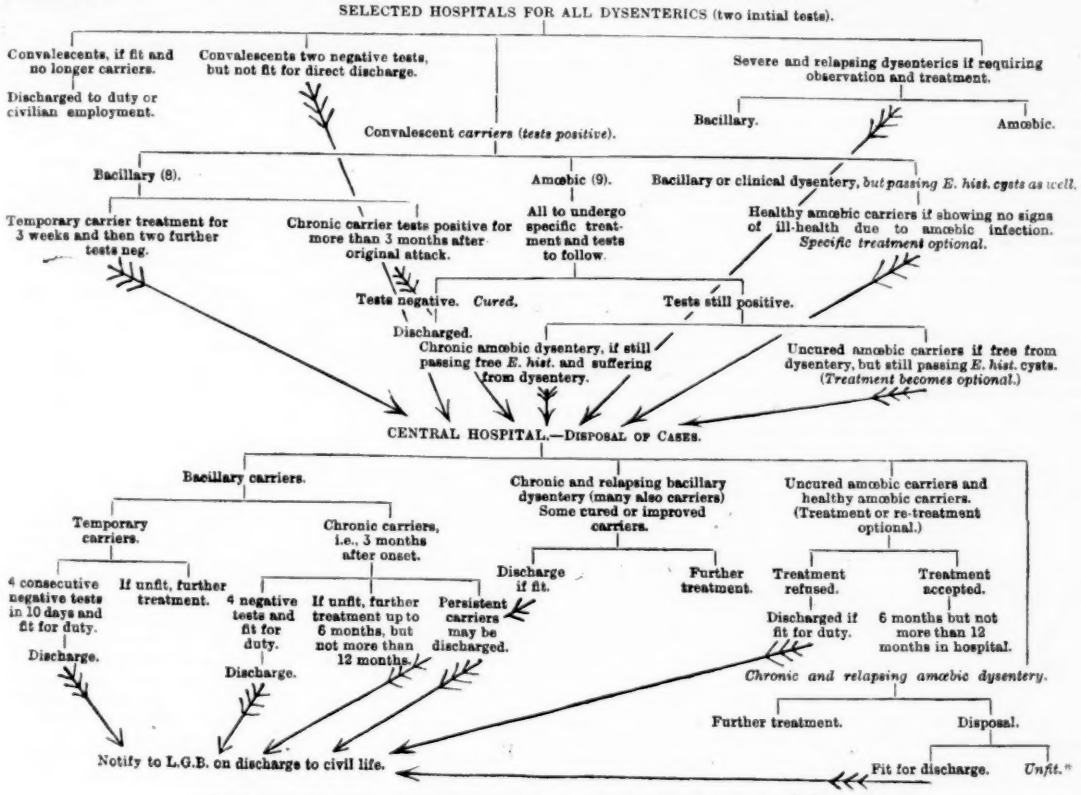
Results of Bacteriological and Protozoological Tests.

The standardising of laboratory examinations, in particular of the stools of amœbic carriers, is a matter demanding careful attention in order to equalise the results of bacteriological and protozoological tests. It goes without saying that the reliability of the results will vary directly with the training and experience of the observer, and it is certain that, especially in the case of protozoological examinations, the results obtained in different laboratories and by different workers in the same laboratory may compare very unevenly.

To a less extent the personal equation of equally well-trained observers is a factor which may inevitably affect the uniformity of the results. It is therefore of the greatest

A.C.I. 78 (Tabulated.)

Tabulated Classification of Disposal of Dysenterics.


SELECTED HOSPITALS FOR ALL DYSENTERICS (two initial tests).
Convalescents, if fit and no longer carriers.
Discharged to duty or civilian employment.
Convalescents two negative tests, but not fit for direct discharge.
Severe and relapsing dysenterics if requiring observation and treatment.
Bacillary.
Amœbic.
Convalescent carriers (tests positive).
Bacillary (8).
Amœbic (9).
Bacillary or clinical dysentery, but passing E. hist. cysts as well.
Temporary carrier treatment for 3 weeks and then two further tests neg.
Chronic carrier tests positive for more than 3 months after original attack.
All to undergo specific treatment and tests to follow.
Healthy amœbic carriers if showing no signs of ill-health due to amœbic infection. Specific treatment optional.
Tests negative. Cured.
Tests still positive.
Discharged.
Chronic amœbic dysentery, if still passing free E. hist. and suffering from dysentery.
Uncured amœbic carriers if free from dysentery, but still passing E. hist. cysts. (Treatment becomes optional.)
CENTRAL HOSPITAL.—DISPOSAL OF CASES.
Bacillary carriers.
Chronic and relapsing bacillary dysentery (many also carriers) Some cured or improved carriers.
Uncured amœbic carriers and healthy amœbic carriers. (Treatment or re-treatment optional.)
Temporary carriers.
Chronic carriers, i.e., 3 months after onset.
4 consecutive negative tests in 10 days and fit for duty.
If unfit, further treatment.
4 negative tests and fit for duty.
If unfit, further treatment up to 6 months, but not more than 12 months.
Persistent carriers may be discharged.
Discharge if fit.
Further treatment.
Treatment refused.
Treatment accepted.
Discharge.
Discharge.
Discharged if fit for duty.
6 months but not more than 12 months in hospital.
Chronic and relapsing amœbic dysentery.
Further treatment.
Disposal.
Notify to L.G.B. on discharge to civil life.
Fit for discharge.
Unfit.*

* Discharged after six months for further observation and treatment under the L.G.B. scheme.

importance to obtain a reliable standard of tests by securing as even a balance as possible in the selection of protozoologists of an equally high class of training.

Formerly, three was the requisite minimum of consecutive negative protozoological tests laid down before an amœbic carrier could be regarded as free from infection. With this minimum Dobell estimated as probable that not more than one-half to two-thirds of the infected cases would be detected, and suggested six negative examinations as the necessary minimum in practice. From the reports of the Liverpool School of Tropical Medicine it has been concluded that only 50 to 57 per cent. of positive cases are discovered as the result of three examinations.

The standard of the triple negative test, therefore, admitted of considerable error in the disposal of those presumed on this basis to be no longer infected, and exposed the past scheme of laboratory tests as unreliable, even to the extent of courting criticism of an extreme kind—that, because unreliable, therefore unnecessary! Such criticism would certainly have gained support from the recent important contribution to THE LANCET[1] by H. A. Baylis on the incidence of *Entamœba histolytica* among 400 healthy new entries to the Royal Navy, 10 of whom were found to be carriers of *E. histolytica*. The calculation is made that among the adult male population the percentage of such carriers must be nearly 6, and Baylis suggests that if this be the case the necessity for vigorous treatment of carriers who have themselves not had dysentery is open to doubt or even not justified. By the adoption, however, of the standard of six consecutive negative tests before an amœbic suspect, convalescent or carrier, is pronounced free of infection, the recent A.C.I. 78 largely reduces the margin of error, and adds considerably to the reliability of the final results in each case.

The Question of Control and After-Care.

The question of what measure of control can reasonably and consistently be exercised over the freedom of a carrier is one demanding close attention in the interests of the individual concerned and for the proper protection of the general public from possible infection. In a military hospital, especially where carrier patients on return from service abroad are anxiously awaiting demobilisation or discharge, and becoming restless under the necessary restrictions connected with leave, the problem calls for firm and tactful handling. As a disciplinary and needful safeguard it is stipulated that until a stay of at least three months in hospital has been completed leave can only be granted in exceptional cases to patients, and is withheld in the case of those due for a course of treatment or for tests, and, as a rule, can only be sanctioned after three clear tests have been obtained.

The important precautions are taken, firstly, of warning those going on leave of the necessity for care and cleanliness, and for avoidance of any but properly flushed latrines; and secondly, of notifying the medical officer of health of the district to which a patient is going. It is further laid down in A.C.I. 78 that on the discharge from any hospital of an uncured or chronic case of dysentery (amœbic or bacillary), and of any bacillary carrier, a notification should be sent to the Local Government Board stating the full destination of the man on discharge, together with particulars of his case, treatment, and laboratory reports, present state of health, and date of discharge.

Such information opens the way for "following up" and "after-care," the necessity for which will compel the attention of the public health authorities, particularly in the case of those uncured and inevitably liable to relapse, and will demand the provision of an organised scheme of treatment and observation. Such provision should be met by the Order just issued by the Local Government Board making both bacillary and amœbic forms of dysentery notifiable. With the records thus available, prompt and effective treatment will be secured for the individual, and protection will be afforded to the community by preventing a known carrier from engaging in the milk trade or obtaining employment in which the preparation and handling of food are concerned.

[1] THE LANCET, 1919, i., 54.

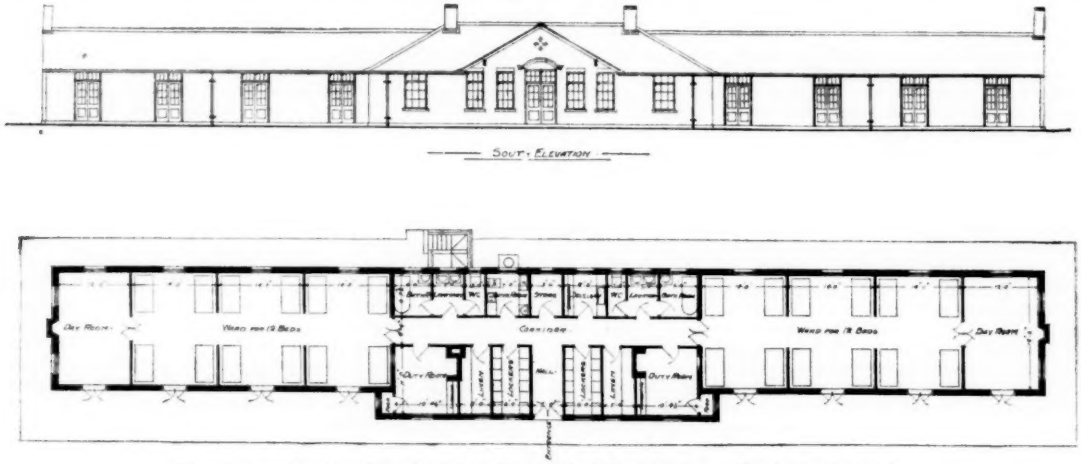
TUBERCULOSIS.

Colonisation of the Tuberculous.

IN a Memorandum by Mr. J. E. Chapman,[1] of the Local Government Board, the value and prospects of the colony system are critically discussed. He finds that the experimental stage has not yet been passed, and that until more experience has been accumulated the adoption of any extensive system of colonies is undesirable. On the other hand, he recommends the tentative development of the colony system along lines which the present limited experience has shown to be the most promising. The Memorandum marks the many blind alleys to which the colony system is apt to lead, and lays down certain principles which experience has already proved to be of importance. The colony, it is noted, should be attached to the sanatorium and not be an isolated unit. It cannot be self-supporting; indeed, the gross expenditure per patient will be as great as, or greater than, in a sanatorium. Of the total expenditure, however, it is possible that 50 per cent. may be recovered by the sale of produce. The Memorandum discusses the various occupations suitable for the tuberculous, and exposes the popular fallacy that agricultural work is light and easily learnt. The attitude of the trade-unions towards the half-trained tuberculous wage-earner is noted as one of the many obstacles to subsidising this class of labour. The functions of the colony, it is suggested, should not be confined to housing and training the early case; it should also offer asylum to the moderately advanced case, the patient being fit enough to do a little work and not ill enough to accept treatment in a hospital. The Memorandum gives a short account of the six colonies already in existence in England and Scotland, and it publishes plans of houses, suitable for the tuberculous, drawn by Mr. H. A. Chapman, F.R.I.B.A.

The Local Government Board Standard Sanatorium.

The plan, prepared by the Local Government Board's architect, for a detached pavilion to accommodate 24 beds is reproduced below. In the event of only 12 beds being required, half the block, including the day room, could be



Plan and south elevation of the L.G.B. Standard Sanatorium. Total length, 173 ft.

erected. The underground heating chamber is also intended for drying clothes. If the site levels do not allow of convenient drainage for the boiler-house some other arrangement will be necessary. It is assumed that staff accommodation is provided in pre-existing quarters. But for cases in which these do not exist the Board has drawn up alternative plans. No standard specification has been prepared, but in view of the shortage of timber and cement some form of brick-work will probably have to be employed. Steel should be used as a substitute for timber in roofs and walls and as a frame-work when concrete blocks or slabs are available. The Board does not, however, recommend the erection of new buildings unless pre-existing buildings cannot be adapted to the needs of the tuberculous patient.

Annual Tuberculosis Reports.

Belfast.—This report, which is for the year ending March 31st, 1918, gives an admirable survey of the polymorphous machinery of the present-day tuberculosis campaign. In the few years of its existence the work of the Belfast campaign has gone up by leaps and bounds. Thus 1791 patients were examined in the first year (1914–15) of the scheme, 3420 in the year under discussion. But though more examinations of contacts were made, fewer new cases of tuberculosis were discovered in this than in the preceding year. Bacteriological work has been carried on in spite of war-time difficulties, and encouraging results have been obtained by the use of special vaccines in secondary infections and in primary infections simulating tuberculosis. Tuberculin, too, has been found beneficial in glandular, osseous, and abdominal tuberculosis. The annual tuberculosis mortality for Belfast being estimated as 1137, the calculation is made that for every person dying of tuberculosis five were under treatment. This high "treatment ratio," it is claimed, is an index to the efficiency of the supervision of sources of infection. Of "contacts" examined, 72 per cent. were found to be tuberculous. (The report does not state what criteria were adopted in this investigation.) The number of visits paid in the year by the nursing staff was 32,766. The sanatorium section of the report deals with the old complaint that the disease is often advanced before admission; 58 per cent. were in the third stage of the disease on admission. And yet Belfast is well supplied with beds for the tuberculous, and there is seldom any waiting list. Another familiar complaint is of the frequency with which patients leave at their own request. This was the case with 77·5 per cent. of the men, 67·4 per cent. of the women. "Out of 78 pensioners ..... not one was discharged on medical advice." Apparently many different factors contributed to this deplorable state of affairs.

Lancashire.—The report for 1917 is of no small volume, and its 88 pages are crammed with much useful information, local and general. The county council has a population of 1,568,656 to provide for, and 123 sanitary districts to administer. At the end of 1917 there were 509 beds for the tuberculous, and provision was made for 30 dispensaries. For administrative purposes the county has been divided into six areas, each under the charge of a senior medical officer with provision, under normal conditions, for one or two medical assistants. A considerable part of the report is occupied by separate reports from these six areas. Two complaints, with which the report deals, deserve special attention. It has been found that the system of notification of tuberculosis is still so imperfect that many patients die before or within three months of notification. Another obstacle to the efficient working of the tuberculosis campaign is the

[1] Memorandum on the Share of "Colonies" (Institutions for Training and for Employment) in the Treatment of Tuberculosis. By J. E. Chapman, M.R.C.S., L.R.C.P. Published by H.M. Stationery Office. 1918. Price 2s.

disfavour into which the sanatorium has fallen; as many as 115 soldiers and sailors gave up sanatorium treatment before the period granted them had expired. Yet the results obtained in the county's sanatoriums are comparatively good, an analysis dealing with over 2000 cases showing that after a lapse of 60 months or less, 80 per cent. of the patients in the first, 60 per cent. in the second, and 39 per cent. in the third stage of the disease were still fit for work. It is encouraging to note that, according to the report, active pulmonary tuberculosis is an exceedingly rare sequel to "gassing."

Kent.—The fifth annual report of the Kent County Council and Insurance Committee on Tuberculosis is edited by Dr. Alfred Greenwood, and is distinguished by numerous statistical analyses. The growth of the tuberculosis campaign in Kent may be partially gauged by the rise in the number of sputum examinations; these totalled only 362 in 1912 and rose to 1948 in 1917—the year with which the report deals. Twenty-one tuberculosis dispensaries and one "calling station" have been started, and 40 beds at the Keycol Hill Hospital have been reserved for insured tuberculous patients. The average duration of sanatorium treatment was about 13 weeks. The county council's sanatorium at Lenham was completed during the year, but it was temporarily taken over by the Army Council for tuberculous patients of the Canadian forces.

Walsall.—This report, for the year 1917, shows a decline in the notifications of all forms of tuberculosis and in the mortality from pulmonary tuberculosis. Only 15 beds, in three different sanatoriums, have been available for the county borough. Of all the patients discharged from sanatoriums, 58 per cent. were "in full work" at the end of the year. An index to the scope of dispensary treatment is to be found in the average weekly attendance of 147 patients.

York.—This report, for the year 1917, is a record of work carried out in spite of difficulties, not the least of which was the absence of the permanent tuberculosis officer on active service and the rapid succession of his substitutes. Of the patients given sanatorium treatment, 2 died, 33 were discharged with the disease arrested, 14 with the disease quiescent, and 21 without material improvement. There were 334 applicants for dispensary treatment.

"*Tubercle.*"

We have received a preliminary announcement of a new monthly journal entitled *Tubercle*, to be devoted to all aspects of tuberculosis, and intended to give tuberculosis workers an opportunity of forming a fraternity for mutual help. The first number is to appear in October next, and will contain, along with original articles, a summary of current pathological, clinical, and sociological work. The literature of tuberculosis will be reviewed, societies and special meetings of public bodies dealing with tuberculosis are to be reported, and letters will appear from recognised authorities abroad. The correspondence columns of the journal will be open for free discussion of the various topics thus brought under consideration. The journal is under the general editorial direction of S. Roodhouse Gloyne, Claude Lillingston, Egbert Morland, and Stanley Tinker. The publishers are Messrs. John Bale, Sons, and Danielsson, of 83, Great Titchfield-street, London, W. The price of the journal is provisionally fixed at 25*s.* per annum, post free. In the first few numbers an attempt will be made to present a digest of the situation as existing in the five years of war, and presumably by the date of issue of the new journal many important questions now quite doubtful will be in a position for definite reply.

NATIONAL LEAGUE FOR HEALTH, MATERNITY, AND CHILD WELFARE.—A general meeting of the League and of its constituent sections, which now include the National League for Physical Education and Improvement (with which is amalgamated the Mansion House Council on Health and Housing), the National Association for the Prevention of Infant Mortality, the Association of Infant Welfare and Maternity Centres, the National Baby Week Council, the National Society of Day Nurseries, the Women's Imperial Health Association, and the Women's National Health Association of Ireland, will be held in the Council Chamber, Guildhall, London, on Monday, April 14th, at 3 P.M., the Lord Mayor presiding. Major Astor and Lady Rhondda are to speak on the Ministry of Health, and Lady Ampthill on the proposals of the British Red Cross Society for helping the civil population in peace.

THE HEALTH CONFERENCE OF INSURANCE ORGANISATIONS.

THE annual National Health Conference of Insurance Organisations and Social Workers was held on April 4th, under the auspices of the Faculty of Insurance, at the Central Hall, Westminster.

Presidential Address.

Mr. P. ROCKLIFF, in his presidential address, said the Government had endeavoured to meet the Friendly Society point of view in the Ministry of Health Bill. Sanatorium benefits had been somewhat of a failure as compared with the hopes that were entertained in 1911. Maternity benefits might cease also to be an insurance proposition, because there was undoubtedly a need either of reducing the loss of life among children or of increasing the number of children born. If it were the economic position which prevented the increase in population, then it was highly probable that in the form of a national motherhood grant the maternity benefit might cease to be an insurance benefit. THE LANCET a few weeks ago had said that tuberculosis was a permanent injury to the status of the individual, and he sincerely hoped that the Pensions Ministry, in considering the position of the tuberculous sailor and soldier, would have regard to the fact that there was permanent impairment right away through a man's life.

The Ministry of Pensions.

Sir LAMING WORTHINGTON-EVANS, Minister of Pensions, said that arrangements were being made by the Ministry of Pensions to take over orthopædic hospitals from the Army and establish out-patient clinics in surrounding towns and districts under the direction of the surgeons attached to the orthopædic hospitals. In this way they hoped to be able to make a re-survey of cases which would benefit by further treatment by specialists. Similarly treatment would be provided in hospitals and out-patient clinics for cases of nervous disease.

With regard to training, he estimated that the classes falling within the terms of the Pensions Warrant numbered about 350,000 men. He did not mean that the whole of these 350,000 men desired to receive, or were even qualified to receive, training, but from among these they should expect to find a large number for whom training ought to be provided. For example, there were 24,000 men who had lost a limb by amputation; there were 36,000 men who had suffered from neurasthenia; many of these would require out-door employment; there had been 60,000 suffering from chest complaints, including tuberculosis; and there had been 54,000 men suffering from heart trouble who might have to change their occupation if it previously called for heavy physical strain.

As to the future, the Cabinet had decided that industrial training should be placed under the charge of the Ministry of Labour. The Ministry of Pensions, therefore, would confine itself to training during the time when a disabled man still required medical care and attention.

They would be taking over gradually many hospitals hitherto under the Army, in many of which a start had already been made in preliminary training for the man while in hospital. Six or eight convalescent centres were to be opened throughout the kingdom, where the men would be drafted as soon as possible. At these centres appropriate medical treatment would be given.

In each would be set up small training shops covering a great variety of trades, so that the disabled man would be able to choose the class of training which he desired and on freest possible choice. He would be encouraged, although not forced, to enter upon preliminary training at the convalescent centre, and discharged to take up industrial training under the Ministry of Labour. A start was now being made at the Hayes Filling Factory in Middlesex, which would be in full working order within a few months.

Sanatorium Treatment.

A discussion followed in which Dr. S. G. MOORE, M.O.H. for Huddersfield, said that the statement in THE LANCET to the effect that tuberculosis of the lung was a permanent condition required further definition. As resident medical

officer to a large institution many years ago, it had been his experience that in a large percentage of cases where post-mortem examinations had been made healed scars in the lung were found that could only have been caused by consumption. Tuberculosis of the lung when advanced to a certain stage does produce these scars, and they are permanent; therefore from that point of view tuberculosis is a permanent condition. He had kept records of all cases of tuberculosis passing through his hands, and a considerable number had been in completely normal health for a large number of years and industrially efficient. From the point of view of tuberculosis being permanently healed, therefore, it was a permanent condition, but if we understood the term to mean permanent disability, then in a number of cases tuberculosis of the lung was not a permanent condition. A case of tuberculosis might enter or leave a sanatorium when he or she liked. While realising the undesirability of interfering with the liberty of the subject, he thought it would be in the interests of the individual and of the State if the liberty of the tuberculous subject were circumscribed. If the situation were carefully explained to the patient giving the motives and reasons for such a curtailment of his liberty he thought that even the most democratic individual would be convinced of the necessity for his retention in a sanatorium. Before condemning the present system of sanatorium benefit steps should be taken to see that appropriate cases received earlier treatment. Many patients left a sanatorium when their health was substantially improved, though their lungs were not healed, the reason being that they wished to earn a living and make provision for their families. These patients should be prevented from leaving a sanatorium, but provision ought to be made for their families during the course of treatment.

Sir L. WORTHINGTON-EVANS, replying, said he would deal severely with any cases of exploiting disabled men if brought to his notice. He would consider a suggestion made that tuberculous cases should emigrate to countries where they would enjoy a better chance of life.

Niggardly Grant for Medical Research.

Sir KINGSLEY WOOD, speaking on "Medical Research and the State," said that the House of Commons had unanimously supported the establishment, under the new Health Bill, of a great research department. Its necessity was shown by the recent epidemic of influenza, which had caused economic loss amounting to £120,000,000, while as a State we only contributed £65,000 to research, which they would agree was a stupid and niggardly grant.

Medical Research and the State.

Sir WALTER FLETCHER said that it was particularly appropriate to speak of medical research at such a conference, because it was in connexion with the great insurance movement that Mr. Lloyd George established the Medical Research Fund in 1913, and that would go down historically as the first effective aid ever given by the State in direct support of medical research.

If the war had taught us anything at all it had taught us the absolute dependence of the State for its existence on scientific work. The war was a challenge on the part of Germany and her scientific men against our scientific men who had saved the country from defeat. They had only caught up to Germany just in time, but at the end of the war they were easily leading. The same might be said of medical research, for wherever men had been submitted to the tests of war medical science had been vitally necessary. Although this was recognised now, it was not recognised at the beginning of the war, for a high official had said to him early in 1915, "Damn research; we've got to beat the Germans." We now recognised that beating the Germans involved the applications of scientific methods and inquiry. Not only had science helped the soldier at the front, but we at home had had our food controlled, the first Food Ministry being a relative failure because it did not apply fully scientific advice, and the second a success because it did apply that advice.

During the war there had been more advance in medical progress than in the previous ten years, and not only had research work improved the applications of surgery in regard to the war, but it would leave a lasting benefit on the civilian surgery of the future. Anti-typhoid inoculation has saved us from being plunged into a welter of suffering, and this was due to the research work in the past of Pasteur, Haffkine, and, in this country, Wright and Leishman. Where there had been medical failures they were generally due to lack of application of scientific principles or lack of official encouragement. The plague of influenza, with its enormous death toll, was causing cries for medical science everywhere, and at Labrador out of the thousands of toilers on the coast only 400 Esquimos were said to be alive. From India the details were more horrible than anything De Foe had described with regard to the plague. Of measles we knew hardly more now than we did 20 years ago, rheumatic fever incapacitated our children for life, and the cancer problem still unsolved and generally the gigantic enemy of disease had to be faced.

What army had we in our service to hope for victory. If we took the matter on the lowest ground, forgetting for the moment the urgent need for diminishing pain, there was a great economic loss due to disease. The work of medical research was done by a small army of unseen and little known workers in the laboratories throughout the universities and hospitals of the country by pathologists, physiologists, biochemists, and workers in almost all the sciences, and practically the whole of the work was unpaid. As an example of the way in which research workers were handicapped he gave an instance of a man who had received £100 to solve an important scientific problem, the work took two years and he spent £90 out of the £100 in the actual materials required for the research. The time of the workers, too, was wasted because they were not sufficiently supplied with assistants. Hospitals ought obviously to be the chief home of medical research, but at present the arrangements there were not such as to attract the best men. Medical help was demanded by the nation, but had the nation done anything which would lead it to expect that help? Scientific work was a long battle against the forces of nature, and victory was only secured after months of preparation. The endowment for research in America could be measured by millions. We had only made a beginning, and when the war commenced the science and industrial research department was established.

The work of the Medical Research Committee must be used to build up an active research service so that men might feel that they had a career open to them in which they might go forward in the pursuit of knowledge. It would be monstrous to take away medical research from the Ministry of Health as had been suggested. The country had been impoverished by war, but it would be committing an extravagance if it did not give money liberally for research. Without knowledge there was no vision. Knowledge gave both power and vision; power to relieve mankind of pain and to serve King and country, and vision by which we could give due honour to the wisdom of God in his creation.

Medical Research and the Lessons of the War.

Major-General Sir WILLIAM LEISHMAN said that medical research had played a great part in keeping our armies in a fit condition in the field and in warding off great epidemics which in the past had so often brought fighting to a standstill. It had been the duty of the medical department of the Army not only to care for the health of the soldier, but to anticipate the future and make preparations to face the various problems of disease likely to be encountered in a coming war. Hygiene owed its birth to Parkes, and its birthplace was Netley at the Army Medical School. Since his day the research which had been carried out in the Army had been most economical for the State. Inoculation against typhoid fever would not have been accepted with the confidence of the medical profession if it had not been able to give proofs of its safety and degree of protection. This was the result of years of patient study in the laboratory and a great statistical organisation carried out for five years. Before the war they had accumulated at the laboratories of the R.A.M.C. College large quantities of vaccine, and in the early days of the war large bodies of the troops had been inoculated against enteric fever on a voluntary basis, the number being never below 90 per cent. From the commencement of operations in France till 1918 the country had lost only 289 soldiers from typhoid and paratyphoid fevers. As a contrast in the Boer War the disease killed 8022.

Most of the research work that had been done could not have been carried out without the help of a big State Department behind it. Where there had been failure in research it had almost always been through incomplete knowledge, and further and complete research was therefore necessary. The methods of the past were too wasteful and too slow. Team work was necessary. The power and means must be obtained of enlisting the best brains in any branch of science which may touch on any problem. It was very improbable that any one department of the State could provide all that would be required in the way of material, personnel, organisation, and it would be necessary to collaborate with individuals or bodies outside the department. The war had furnished us with many examples of what might be done by organised efforts along these lines, for though medical problems were always arising and the workers scattered about in different parts, the War Office had only to ask for help in any branch of science in order to receive it. No body had done more in this direction than the Medical Research Committee, and they were much indebted to Sir Walter Fletcher, its energetic and able secretary. This help had been due largely to the fact that it was a State Department and in a position of relative independence, able to offer its assistance to each department of the State and to claim assistance from each one of them.

Lessons forced upon us by war were often rapidly forgotten, but this lesson must not be forgotten. The unsolved problems of disease were no less urgent and important than those dealt with during the war. No single department of the State could afford to work alone, and the medical department of the Army was not only most anxious to continue to profit in this way, but most ready to offer its help. The Army served all over the world and came into contact with diseases of men and animals rarely seen in this country, but any of which might throw light on some grave problems which had to be dealt with at home. The Medical Department of the Army, too, had the advantage of being able to observe for long periods bodies of men under varying conditions of climate and under conditions rare in civil life. There was urgent need for medical research in connexion with our great tropical dependencies. In our African dependencies the needs were acute and were recognised by the Colonial Office, but not easily recognised by public opinion. Not only was it necessary to preserve the lives of natives, but on medical research depended the opening up of great tracks of fertile country at present closed to the white man. If medical research was to progress and yield great results the State itself must be prepared to support it on a generous scale and lend its authority to an effective coördination of work.

National Health Insurance.

Mr. J. H. THOMAS, M.P., spoke at the afternoon session on "The Urgent Necessity for an Increase in National Health Insurance Benefits." The 10*s.* originally granted was now equal to only 4*s.* 6*d.* There was a far greater alteration than mere cost of living. The whole outlook of the people upon the standard of living was altered. The case for the alteration in the benefits was unanswerable. The workers ought to be in a position to pay for their own benefits rather than to receive them as a dole from the State, which had the result of keeping down wages.

Mr. JOHN HODGE, M.P., said both the State and the employer would gain by increasing the benefits and securing a healthier race. Children especially were the greatest assets of the nation, and the country should look after the children. By permitting slum areas and unhealthy factories to remain the Government incurred great responsibility.

Mr. ROCKLIFF said that the question had been investigated on a basis of an increase of a penny in the contribution, while the State would bear two-ninths of the cost. One scheme was prepared giving to men 15*s.* for 13 weeks, 10*s.* for a second 13 weeks, and 5*s.* disablement benefit after that; and to women 12*s.* 6*d.*, 7*s.* 6*d.* and 5*s.* for the same periods. A second scheme would give to men 15*s.* for 26 weeks, 7*s.* 6*d.* for 26 weeks, and 3*s.* 9*d.* disablement benefit, and to women in proportion.

A discussion on "The Relation of Women to Health Matters," which was opened by Mr. Handel Booth, emphasised the need for the proper representation of women on bodies which concerned their work and interests.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

Demobilisation of Doctors.

WITH reference to the announcement in the Scottish press on March 26th to the effect that the Ministry of National Service as from March 31st ceases its functions in connexion with the demobilisation of all medical officers serving with His Majesty's Forces, it is announced that the advisory relations which existed between the War Office, the Admiralty, and the Scottish Medical Service Emergency Committee prior to the establishment of the Ministry of National Service will be resumed as from that date. All applications for the release of Scottish doctors should, as formerly, be made to the secretary of the committee, Royal College of Physicians, 9, Queen-street, Edinburgh.

Scottish Universities Entrance Board.

The Entrance Board intimates that it proposes to issue for the consideration of the Universities, under Section VII. of General Ordinance No. 3 (Regulations as to admission to the Scottish Universities for purposes of graduation), a General Regulation providing that the standard of preliminary education required for admission to the Faculty of Medicine shall be assimilated to that for admission to the Faculties of Arts or Science.

The Retirement of Sir Thomas Fraser.

Sir Thomas Fraser has occupied the chair of materia medica in the University of Edinburgh for 41 years, and his colleagues and the students who have been under him have continuously acknowledged, with grateful appreciation, the inspiration of his teaching. He has taken a leading part in the development of the medical school and the University, and his original investigations constitute important landmarks in the progress of medical science and have contributed much towards the relief of human suffering. It has been proposed to take the occasion of Sir Thomas Fraser's retirement to present him with his portrait. An invitation to join in this expression of common regard has been issued by Professor J. A. Ewing, principal of the University; Sir Robert Philip, president of the Royal College of Physicians of Edinburgh; and Mr. R. M'Kenzie Johnston, president of the Royal College of Surgeons of Edinburgh. Professor Harvey Littlejohn has undertaken to act as honorary treasurer, and contributions may be addressed to him at the University of Edinburgh.

April 7th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Ireland and the Ministry of Health Bill.

THE members of the medical profession in various areas are now meeting to appoint and to instruct delegates to a great meeting of the doctors of Ireland which is to be held at an early date in Dublin at the Royal College of Surgeons. The following propositions form the provisional agenda for submission to the delegates:—

That the needs of the country demand a legislative measure including—

(*a*) A Ministry of Health consisting of a Minister responsible to Parliament and a council with full powers to control policy. The council should consist of three groups: (1) Representatives of the county councils elected by those bodies, say one from each province—4; (2) medical members to be elected by the medical profession of the country—4; (3) four members to be appointed by the Government, one of whom shall be a medical practitioner and one a dentist. This council should meet regularly for a fixed number of sessions per month, and the members should be paid a fee (say £5 5*s.*) per day while sitting, with travelling expenses.

(*b*) The establishment of a National Medical Service, on the principle of the decision of the referendum of the profession taken in 1911. For the members of such service there should be adequate remuneration, provision for promotion, regular holidays, study leave, and pension rights. There should be provision for the family of any medical officer who dies from the result of his service. The members of such service, who are engaged in curative duties, should not be debarred from private practice.

(*c*) Arrangements for medical attendance on the insured classes on a contributory basis.

(*d*) The establishment of a complete sanitary system with county medical officers of health, provided with such skilled assistance as may be necessary in different areas. Such officers should be whole-time officers not engaged in private practice, and to have the assistance of the district medical officers of health in their several areas.

(*e*) The dissociation of medical attendance, whether on poor persons or on the working classes, from the administration of the Poor-laws.

(*f*) The erection of workhouse hospitals into district hospitals, dissociated from the management of the workhouse, and with the county infirmaries, constituting a system of local hospitals to which all local doctors would have access for the treatment of private patients.

(*g*) Adequate provision for the treatment and prevention of tuberculosis and venereal diseases, and (*h*) for the care of expectant and nursing mothers.

(*i*) Adequate endowment of medical research, and provision of laboratory facilities in the several parts of the country.

Other questions to be considered at the meeting of delegates will concern remuneration with respect to:—

(1) Medical attendance on the R.I.C., postmen, coastguards, and others.

(2) Under the Insurance Act—(*a*) the inadequacy of the remuneration for medical certification; (*b*) appointment of medical referees, and the treatment of tuberculosis.

(3) Fees for the registration of births, deaths, marriages, and travelling expenses in connexion with same.

The Chief Secretary for Ireland has promised that the Health Council under the Ministry of Health Bill would be only temporary, and the medical profession hold strongly that an advisory council is useless which has no representatives elected by them, and cannot express their opinions. If, however, all members of the medical profession in Ireland—whether adherents of the "Irish Medical Committee" or of the "Irish Medical Association"—can sink their differences and come to an agreement at this delegates' meeting the Chief Secretary will be obliged—if he is to have the help of the medical profession—to follow mainly their views.

April 7th.

The War and After.

THE CASUALTY LIST.

THE name of the following medical officer appears among the casualties announced since our last issue:—

Died.

Major E. N. Cunliffe, R.A.M.C., was a student at Owens College, Manchester, and qualified in 1901. He held appointments at the Manchester Consumption Hospital and at the Royal Infirmary in that city, and was at one time consulting tuberculosis officer to the Manchester Corporation. He was well known as a practitioner in South Lancashire, and died from illness contracted on active service in France. For some time he was in command of the 2nd Western General Hospital.

THE HONOURS LIST.

THE following awards to medical officers are announced:—

K.C.M.G.

Surg.-Capt. Robert Hill, R.N., C.B., C.V.O., Principal Medical Officer, Grand Fleet.

K.C.B.E.

Surgeon Rear-Admiral George Robertson Turner, C.B., for valuable services as Consultant Surgeon, Royal Naval Hospital, Plymouth.

O.B.E.

Surgeon Commander Charles Kendal Bushe, R.N., for valuable services as Officer in Charge of His Majesty's W./T. Station, Bathurst, Gambia. Hon. Surgeon-Lieut. J. Donald Pollock, R.N.V.R., for valuable services at H.M. Naval Base, Granton. Surgeon-Lieut. Evelyn Dennis Scott, R.N., for valuable services at Queen Mary's R.N. Auxiliary Hospital, Southend-on-Sea.

The deeds for the following awards to medical officers (all of the R.A.M.C. except where otherwise stated) will be published later:—

Distinguished Service Order.

Capt. (acting Maj.) W. B. Allen, V.C., M.C.; Maj. A. C. Amy; Maj. J. E. Blair, Can. A.M.C.; Temp. Capt. (acting Maj.) R. C. Cooke, M.C.; Maj. B. E. Kelly, Can. A.M.C. Temp. Capt. J. H. Moir, M.C.; Maj. G. W. Treleaven, M.C., Can. A.M.C.

Second Bar to Military Cross.

Capt. R. B. Stewart, M.C.

Bar to Military Cross.

Capt. (acting Maj.) J. H. Bayley, M.C.; Temp. Capt. E. Biddle, M.C.; Capt. (acting Maj.) T. W. Clarke, M.C.; Capt. (acting Maj.) H. N. Goode, M.C.; Temp. Capt. (acting Maj.) C. H. Haddow, M.C.; Capt. (acting Maj.) C. Nicholson, M.C.; Temp. Lt. T. G. Playford, M.C.; Temp. Capt. (acting Maj.) A. Richmond, M.C.; Capt. (acting Maj.) A. L. Shearwood, M.C.; Capt. (acting Maj.) H. Shield, M.C.; Capt. G. A. Smith, M.C., Can. A.M.C.; Capt. (acting Maj.) R. A. Stark, M.C.; Capt. R. C. Weldon, M.C., Can. A.M.C.; Temp. Capt. (acting Maj.) I. S. Wilson, M.C.

The Military Cross.

Capt. (acting Maj.) G. F. Allison; Temp. Capt. (acting Maj.) L. Anderson, D.S.O.; Lt. E. R. Batho; Capt. J. P. Bonfield, Can. A.M.C.; Temp. Lt. S. F. Boyle; Temp. Lt. A. F. Calwell; Temp. Hon. Capt. D. E. Carter; Capt. R. J. Chapman; Capt. D. G. Cheyne; Temp. Capt. H. M. Cockcroft; Temp. Capt. A. F. R. Conder; Capt. W. M. Cox; Capt. J. A. Dougan, Can. A.M.C.; Capt. J. J. B. Edmond; Temp. Capt. D. Ferguson; Capt. (acting Maj.) T. O. Graham; Temp. Capt. H. A. Grierson; Temp. Hon. Capt. E. Harding; Capt. J. G. Hill; Temp. Capt. T. Howell; Capt. G. G. Jack; Temp. Capt. R. W. P. Jackson; Temp. Capt. A. C. Laing; Temp. Capt. F. W. K. Lawrie; Temp. Capt. P. G. Leeman; Capt. (acting Maj.) H. W. Maltby; Capt. H. Mendelsohn, Austr. A.M.C.; Capt. W. C. Morgan, Can. A.M.C.; Temp. Capt. D. L. Morrison; Capt. J. A. Pare, Can. A.M.C.; Lt. M. C. Paterson; Lt. A. V. Pegge; Capt. (acting Maj.) A. Picken; Capt. (acting Maj.) R. P. Pollard; Capt. (acting Maj.) H. B. Pope; Capt. W. B. Rennie; Capt. S. Robertson; Capt. (acting Maj.) W. A. Robertson; Capt. (acting Maj.) H. J. D. Smythe; Temp. Capt. T. Stordy.

FOREIGN DECORATIONS.

Italian.

Order of the Crown of Italy: Commander.—Col. (temp. Maj.-Gen.) G. B. Stanistreet, C.B., C.M.G.

Belgian.

Croix de Guerre.—Maj. J. V. H. Guest, Austr. A.M.C.; Lt.-Col. A. F. Jolley, Austr. A.M.C.

BROUGHT TO NOTICE.

The names of the following medical officers are brought to notice for gallant and distinguished service in connexion with operations at Aden:—

R.A.M.C.—Lt.-Col. E. P. Connolly; Capt. D. T. Richardson.
I.M.S.—Lt.-Col. T. H. Foulkes; Maj. (temp. Lt.-Col.) I. M. Macrae; Temp. Capt. M. K. Pillai.

THE Metropolitan Asylums Board has made arrangements to acquire from the War Office the military hospital at Trouville. This hospital, which has been offered to the M.A.B. for £5000, cost the War Office £150,000. The cost of removing the hospital to England and equipping it as a sanatorium is to be borne by the M.A.B. Before the war the M.A.B. acquired sites for sanatoriums at East Grinstead, Basingstoke, and near Godalming, and the pre-war estimates for erecting sanatoriums on these sites ranged from £30,000 to £40,000 each.

AUXILIARY ROYAL ARMY MEDICAL CORPS FUNDS.—The usual quarterly committee meeting was held on April 4th, at 11, Chandos-street, Cavendish-square, W. Three grants were made to cases in the Benevolent Branch for Officers, and two grants to cases in the Relief Branch for the Rank and File. These Funds are for the relief of widows and orphans of commissioned officers and N.C.O.'s and men of the rank and file of the R.A.M.C., Special Reserve, Territorial Force and New Armies, and also for the relief of the children of those who have been so severely damaged in the present war that they need help for the education of children. Requests for relief should be addressed to the honorary secretary, Sir William Hale White, at the offices of the Funds, at 11, Chandos-street, Cavendish-square, W. 1.

ROYAL PORTSMOUTH HOSPITAL.—At the annual meeting of the Royal Portsmouth Hospital held on March 28th it was reported that the civilian in-patients numbered 1953 and the military 1105, making a total of 3058. The daily average number of beds occupied was 173; the average cost per bed occupied was £78 19*s.* 10*d.*, the heaviest recorded. In the venereal department 627 new patients attended during the year, making a total of 1186 since the department was opened in February, 1917. The number of attendances was 11,144, compared with 8636 in 1917. The expenditure, £15,489, was also a record and exceeded the ordinary income by £2431. At the request of the Ministry of Pensions a temporary arrangement had been made by which discharged and disabled sailors and soldiers may be admitted as in-patients up to 25 in number, provided there is accommodation, the War Pensions Committee undertaking responsibility for them.

Obituary.

EDWARD LIVEING, M.D. CAMB., F.R.C.P. LOND., M.R.C.S.

Dr. Edward Liveing, Emeritus Registrar of the Royal College of Physicians of London, who died on April 2nd at the age of 87 years, was second son of Edward Liveing, M.R.C.S., of Nayland, Suffolk. Educated at King's College, London, he proceeded to Gonville and Caius College, Cambridge, whence he graduated with honours in mathematics in 1858, and in medicine in the following year, for he was already M.R.C.S. In 1859 he became a Member of the Royal College of Physicians of London, obtaining the Fellowship in 1874. For a time he held the post of assistant physician at King's College, London, and was later a member of the Council and a Fellow of the College. In 1870, the year in which he obtained the M.D. Cambridge, he was appointed examiner in medicine at the University. In 1886 he acted as assistant registrar of the Royal College of Physicians of London, becoming registrar in 1889 on the resignation of the late Sir Henry Pitman, which office he held for 20 years. Dr. Liveing was consulting physician to Marylebone General Dispensary. He was the author of "Sick Headache and Some Allied Disorders: A Contribution to the Pathology of Nerve Storms," which was published in 1873. This in its time was a valuable contribution to scientific medicine and was a testimonial to the originality and industry of its author.

SIR JAMES MACKENZIE DAVIDSON, M.B., C.M. ABERD.,

CONSULTING MEDICAL OFFICER, X RAY DEPARTMENT, CHARING CROSS HOSPITAL, ETC.

THE death of Sir James Mackenzie Davidson, which took place on April 2nd at the age of 62, is a loss which will be felt far beyond the borders of the medical profession. He was one of the few men to gain high distinction in the two fields of surgery and physical science, and the unstinted devotion of his talents to alleviate the suffering of war must have won for him the gratitude of many thousands of our soldiers.

Sir James Mackenzie Davidson was born at Buenos Aires in 1856. He received his education in the Universities of Edinburgh and Aberdeen, graduating in medicine and surgery at the age of 25. Four years later he contributed an article to THE LANCET on "The Electric Light Applied to the Ophthalmoscope." He was for some time lecturer on ophthalmology in the University of Aberdeen and held various important appointments in that city until the year 1897, when he came to London. In the following year, before the Section of Ophthalmology of the British Medical Association, he gave a remarkable demonstration of the employment of Roentgen rays in ophthalmology. His method was based on getting the three coördinates of any point. If the three coördinates were found, the position of the point—that is to say, of the foreign body—in the eye could be ascertained. From that time forward the history of the localisation for surgical purposes of foreign bodies, not only in the eye but elsewhere in the body, is largely the history of the development of Mackenzie Davidson's work.

Cross-thread localisation, of the greatest use in civil surgery, became invaluable in time of war. In South Africa it was the recognised method of the British Army, and in the European war it was applied on a much vaster scale by a host of workers, for the inventor set himself diligently from the very first day of the war to instruct others in his method. His natural bent was teaching and nothing delighted him as much as an interested student. But he did far more than this, he localised innumerable cases with his own eye and hand. To this task he gave freely of his resources and equipment. Not only so, but his eager mind was always intent upon some new device to secure precision or increased adaptability or simplified technique. His X ray couch, which was continually being modified in some detail, is an instance of his inventive genius.

The pioneers in X ray work had most of them to pay a heavy toll for the knowledge they won to science. Mackenzie Davidson was no exception; he had to submit his right hand to more than one painful operation. He was a pioneer, too, in other branches of applied physics. He was responsible for the application of the stereoscope to the viewing of the X ray picture and the device—which he improved if he did not originate—of guiding the extraction of a bullet by means of a telephone probe. This latter method he had employed as far back as the "eighties" at the Aberdeen Royal Infirmary. He was greatly interested in the therapeutic use of radium and had experimented with thorium. His one book, "Localisation by X Rays and Stereoscopy," is a summary of his life-work; yet such was his mental energy that it was hardly in print before he had put out of date some of the methods described. At the International Medical Congress of 1913 he was President of the radiology section. At the time of his death he was consulting medical officer to the X ray department of Charing Cross Hospital and at the Royal London Ophthalmic Hospital, while he also held advisory positions at several important military establishments.

Sir James Mackenzie Davidson is survived by Lady Mackenzie Davidson, a son and a daughter, with whom sincere sympathy is felt.

WILLIAM ALLEN STURGE, M.V.O., M.D., F.R.C.P. LOND.

Dr. W. A. Sturge, who died at his residence, Icklingham Hall, Suffolk, on March 27th at the age of 68 years, was educated privately, and studied medicine at University College, London, at Bristol, and in Paris. He obtained the M.R.C.S. diploma in 1873, and took the M.B. degree of the University of London in the following year with honours. In 1875 he obtained the M.D. Lond., and in 1876 became a Member of the Royal College of Physicians of London, and was elected to the Fellowship in 1891. The enthusiasm with which he entered upon his career and the success of his work at the Royal Free Hospital (where he was physician and pathologist), at the Hospital for Epilepsy and Paralysis, and the Royal Hospital for Children and Women, Waterloo Bridge-road (where he was physician), marked him out for the career of a leading London physician, but the health of his wife breaking down he sacrificed his opportunities, and in 1881 took up practice in Nice, where he soon established for himself a prominent position as a consultant, and was held in great esteem alike by his French colleagues, his patients, and the municipal authorities. His services to the late Queen Victoria while at Cimiez were greatly appreciated by Her Majesty. In 1907 Dr. Sturge returned to England and settled at Icklingham, where he devoted his time to archæological problems, the district in which he lived being in the centre of one of the richest fields for this study. He accumulated a fine collection of Greek works of art, as well as prehistoric flint instruments. The results of his archæological studies have been printed from time to time in the Proceedings of the Prehistoric Society of East Anglia, of which body in 1908 he was the first president. His collection of stone implements has been bequeathed to the British Museum. His second wife, who survives him, was an enthusiastic student, and greatly helped him in his studies.

EDMUND BARON HARTLEY, C.M.G., M.R.C.S.,

VICTORIA CROSS; LATE COLONEL COMMANDING CAPE MEDICAL CORPS.

Colonel E. B. Hartley, whose death occurred on March 20th, in his 72nd year, was eldest son of Dr. Edmund Hartley, of Ivybridge, Devon. Educated at a private school, he began his career as a civil servant in the Inland Revenue office. In 1869 he forsook figures for medicine, entering St. George's Hospital, London, and taking the diploma of M.R.C.S. in 1874. No sooner legally qualified than he began his life of adventure. After four years as district surgeon in Basutoland he joined the colonial forces in 1877, and served in Galeka and Gaika. In June, 1879, came his greatest adventure, when he was awarded the Victoria Cross for attending to the wounded under fire during the attack on Morosi's Mountain in Basutoland. After this he saw service in Tembuland, was wounded in Bechuanaland in the year 1897, and for his devotion to duty in the South African War (1899-1901) was awarded the C.M.G. and medals with five clasps. For 23 years he was principal medical officer to the Cape Colonial Forces. On retiring with the rank of lieutenant-colonel he engaged for a time in private practice in Cape Colony, until his return to this

country, when he settled at Ilminster, Somerset, the pursuit of golf and fishing serving as an outlet to his love of the outdoor life. In addition to his military and civil honours Colonel Hartley was honorary associate of the Order of St. John of Jerusalem. He married the daughter of the late James Rose-Innes, C.M.G., Under Secretary for Native Affairs at Cape Town.

ERNEST NICHOLSON CUNLIFFE, M.D. MANCH., M.B., B.S. LOND., M.R.C.P.,

MAJOR, R.A.M.C. (T.F.); HONORARY PHYSICIAN, MANCHESTER ROYAL INFIRMARY.

BY the death of Dr. E. N. Cunliffe the Manchester School of Medicine has lost a physician of great ability. A member of a Bolton family, he was educated at Monmouth Grammar School. In 1896 he entered the medical school of Manchester University, and after a brilliant studentship, during which he obtained many scholarships and prizes, he graduated in medicine in the Universities of London and Manchester. After holding several resident hospital appointments he obtained the M.R.C.P. Lond. in 1906, and was elected to the honorary staff of the Manchester Royal Infirmary at the early age of 28 years, and subsequently to a lectureship in clinical medicine in the University of Manchester. As a teacher he early achieved a considerable reputation, and as an organiser and administrator he possessed unrivalled qualities.

At the commencement of the war he was a member of the *à la suite* staff of the 2nd Western General Hospital, and in the following year he was appointed registrar of this hospital with the rank of major. In April, 1917, he became acting officer commanding the hospital with the rank of lieutenant-colonel, a position he held with conspicuous success until the beginning of his last illness in September, 1918. From November, 1917, to May, 1918, he served in France with the 57th General Hospital, when he was extremely popular with all ranks in the unit. During recent years there were indications that his interests were becoming directed towards the forensic aspects of medicine, and for some time he had acted as medical referee under the Workmen's Compensation Act. His untimely death at the age of 41, after a long and painful illness, has deprived Manchester of an able physician, and the Medical School of an upright and loyal colleague. In the world of sport also he was one of the best all-round athletes produced by Manchester. At Rugby Union football he was an excellent half-back; as a runner he represented Manchester University both in the mile and quarter mile races. At lawn tennis his play was much above the average and at fives he had few superiors, but it was perhaps as a pedestrian that his dogged and untiring qualities revealed essential traits of his character.

He died at the Officers' Hospital, Windermere, and was buried on April 3rd at St. Mary's, Windermere, with military honours, the bearer party being composed of non-commissioned officers of the 2nd Western General Hospital. Many of his old friends and colleagues were present at the ceremony and a memorial service held in Manchester was very largely attended by friends, colleagues, and members of the 2nd Western General Hospital.

THE LATE MR. THOMAS LEIGH.—Thomas Leigh, who died at Brighton on the night of March 30th-31st, was one of the oldest medical practitioners in the town, both as regards age and service; and his end was untimely, for he was the victim of a collision with a lady cyclist while walking on his way to visit a patient. Mr. Leigh was the third son of Mr. Henry Thomas Leigh, F.R.C.S., of Chiswick, was born 77 years ago, and studied at St. George's Hospital. He took the degree of M.R.C.S. Eng. as far back as 1863, and had held a number of appointments in Brighton.

THE American Hospital for English soldiers, opened some three and a half years ago at Caen Wood Towers, Highgate, has now been closed, with a record to its credit of 2000 patients treated, no deaths, and no epidemics.

RAMSAY MEMORIAL LABORATORY.—The Ramsay Memorial Committee of the Fund for providing research fellowships and the establishment of a laboratory as a memorial to the late Professor Sir William Ramsay has presented to the University of London £25,000 towards the foundation of a laboratory of chemical engineering at University College.

Correspondence.

"Audi alteram partem."

THE MEDICAL PARLIAMENTARY COMMITTEE: THE ARRANGEMENT OF A CONFERENCE.

To the Editor of THE LANCET.

SIR,—The Medical Parliamentary Committee has issued the following invitation to a conference to medical societies or organisations interested in health questions. Representatives of every such organisation will be welcomed, and if any organisation has not received a formal invitation we shall be obliged if its secretary will communicate with us.

We are, Sir, yours faithfully,

ARTHUR LATHAM,
CHAS BUTTAR,
Hon. Secretaries of the Medical Parliamentary Committee.

20, Hanover-square, W.1, April 7th, 1919.

THE MEDICAL PARLIAMENTARY COMMITTEE.

20, Hanover-square, London, W. 1, April, 1919.

To the Officiate of Medical Societies and Organisations.

DEAR SIR,—On Oct. 1st, 1918, an open meeting of the medical profession was called for the purpose of considering how the views held by the profession on questions affecting the health of the community could best be brought before the House of Commons and the public. The following resolution was moved by the Right Hon. Christopher Addison and passed unanimously:—

That in the interest of the national health it is essential that the considered views of the medical profession should be voiced by representative medical men in the House of Commons.

A Committee—now known as the Medical Parliamentary Committee—was appointed to take steps to further the election of medical men to the House of Commons and to report to a further meeting.

This Committee, under the chairmanship of Sir W. Watson Cheyne, M.P., has, after careful deliberation, come to the conclusion that, if medical men in the House of Commons are to be in the position to voice the considered views of those who have expert knowledge on matters affecting the health of the community, it is in the first place essential that a Committee thoroughly representative of existing medical organisations, and through them of the profession as a whole, should be constituted. It has further come to the conclusion that if this Committee is to enjoy the confidence of the public, as being competent to express an opinion on all matters affecting the health of the community, it should also contain a certain number of representatives of organisations which are concerned with nursing, pharmacy, and hospital administration.

The Medical Parliamentary Committee considers that the proposed committee should act, on behalf of the public and of the professions it would represent, partly as an intelligence bureau and partly as a liaison committee between medical Members of the House of Commons and organisations devoted to health questions. Its chief work would be—

(1) To supply information of the trend of expert opinion on health questions to medical Members of Parliament.

(2) To furnish early information of impending legislation to the constituent bodies.

(3) To facilitate communication between the several bodies affected by any proposed legislation.

(4) To assist in increasing medical representation in Parliament.

It is not proposed to question the autonomy or activities of any of the constituent bodies, but it is felt that the time has come for a federation of all bodies or associations interested in health questions, which would be able to devote all its energies to assisting Parliament to direct legislation affecting the health of the community on lines in accordance with expert opinion.

Accordingly our Committee is inviting all medical organisations which have as their objective, or take an interest in, medico-political activity, and a few organisations concerned with nursing, pharmacy, and hospital administration, to send a representative to a conference for the purpose of discussing the best method of constituting a permanent Medical Parliamentary Committee on the lines indicated above. This conference will meet under the chairmanship of Sir Wm. Watson Cheyne, Bart., K.C.M.G., C.B., M.P., at the Central Hall, Westminster, S.W. 1, on Friday, May 2nd, 1919, at 3 P.M.

We shall be glad to be informed at an early date whether your council is interested in the subject, and, if so, whether it will send a representative.—Yours faithfully,

ARTHUR LATHAM,
CHARLES BUTTAR, } Hon. Secretaries.

THE RECENT EPIDEMIC OF "SPANISH INFLUENZA."

To the Editor of THE LANCET.

SIR,—I make a suggestion to explain the cause of the recent epidemic. For over two years I have seen cases with points of interest. They differed from cases I treated during the last 25 years, except one 20 years ago. They all had features in common, though differing widely in other respects. The cases have grouped themselves in my mind into pulmonary and intestinal types. The symptoms were a slight rise of temperature, very rapid pulse, tongue thickly coated, more or less vomiting, and slight albuminuria; also pain in head and usually in epigastrium. In the pulmonary type there were cyanosis, rapid breathing, and crepitations (mixed in character) at the bases. In the intestinal type the vomiting and epigastric pain were more marked. Both types in their general features show a strong resemblance to diphtheria and are rapidly fatal. They never show the ordinary diphtheritic membrane in throat or nose. I have not had an opportunity of making a post-mortem. The resemblance to diphtheria led me to use antitoxin; it always effected a cure if given soon enough.

It is impossible to recall these cases without noticing their resemblance to "Spanish influenza." Towards the end of October the epidemic came with ever-increasing numbers and with every variety of onset and course. The resemblance to the previous cases was in many very slight. All the more severe cases I treated at first with antitoxin, but seeing no difference I gave it up. Then as fatal cases became more numerous, it struck me that all the early cases treated with antitoxin had survived, no matter how severe at first. So I returned to its use; and about 30 severe cases in which it was given all recovered except two (in both given too late). The relief to the patient was marked, the course was shortened, and the resulting weakness less.

I do not think I have been alone in observing these pre-epidemic cases. They are not unlike those described in THE LANCET.[1] Also one or two cases described as acute œdema of lung. If it is granted that these early cases are true diphtheria, what is the change that has occurred in the disease to give the epidemic form? It is not a double infection. In the epidemic there was a disease intensely infectious at some stage and showing all degrees of severity, from little more than ordinary influenza to severe cases, including double pneumonia and gastritis. These variations are probably best explained by supposing the development of a hybrid micro-organism. This germ might resemble either parent, or neither, and might appear in a variety of forms. We can assume that this hybrid germ is a cross between the ordinary influenza bacillus and the Klebs-Löffler bacillus. The effect on the host of these varying hybrids would also vary, and even without differences in form we might expect varying effects. With such a germ we might expect intense infectivity and great variations in type, from little more than influenza to all degrees of severe diphtheritic infection. At the same time, all forms might be curable with diphtheria antitoxin. Families who had had diphtheria escaped usually completely, while a recent attack of influenza gave no protection. I know of no case where a person who had had the "pre-epidemic disease" was also attacked by the epidemic.

Supposing a hybrid such as described to have been produced there is a fair prospect that it will be a mule, and so, when the last contact has run its course, the disease will disappear, perhaps for a long period, or at any rate until circumstances are favourable for the hybrid to be bred afresh. I am, Sir, yours faithfully,

Hastings, N.Z. ROBERT NAIRN, F.R.C.S. Eng.

INSTRUCTION IN HYDROLOGY.

To the Editor of THE LANCET.

SIR,—Recently I applied to the various medical authorities in the United Kingdom for information with regard to a suitable course of instruction in hydrology for medical officers. I was astonished to ascertain that such a course was non-existent. I suggest that there never was a better occasion than the present to initiate such a course, in order that the scientific knowledge of the Motherland might be immediately available for the use of medical officers in the United Kingdom and in the Dominions.

While on this subject I would like further to suggest, in order to make a duly qualified medical officer quite *au fait* with all the different problems which are likely to be placed in front of him, that he should take a prescribed course in biochemistry, physiology, geology, physics, and climatology, as such knowledge should prove of the greatest benefit to him in his hydrological investigations. It is not opportune at this stage to dilate upon the method of procedure by which the greatest use could be made of the scientific investigations for the benefit of patients, but I would suggest that while the scientific knowledge which would accrue to the investigator would be upon sound lines the actual purely scientific investigations and the clinical aspects should work separately, except for frequent round table conferences which would give the necessary coördination between the scientific and the clinical points of view.

Would not the University of London take up the important matter of founding a Chair in Hydrology? Such a step would receive whole-hearted support from the medical profession at home and in all parts of the Empire.

I am, Sir, yours faithfully,

B. E. MYERS, M.D., M.R.C.P.

Medical Headquarters, New Zealand Expeditionary Force, 28, Bloomsbury-square, London, W.C., April 3rd, 1919.

"HOT LIQUIDS AND CANCER."

To the Editor of THE LANCET.

SIR,—Referring to the letter of Dr. M. J. Petty, jun., under the above heading in THE LANCET of April 5th, I should be glad to record my own conviction, the result of observations and inquiries extending over many years, that hot food and hot drinks, by causing a chronic congestion of the tissues with which they come in contact, are factors in diseases of the alimentary tract, beginning with the gums. Chronically congested tissues have not the same power of resisting trauma or bacterial infection that normally healthy tissues possess. It is not *one* cup of hot tea or coffee, not *one* plateful of hot porridge or hot soup, but the taking of liquid or pappy food hotter than the mouth and stomach day after day for years, that is injurious. No one who has not taken the trouble to observe and experiment can have the least idea how hot the food is that is habitually taken by a large, possibly the largest, proportion of people in England. I refer especially to tea, coffee, soup, porridge, milk puddings, stews, &c., which are taken at a temperature varying from 150° to 190° F., and are described as cold at 120°. The habit of giving food hotter than the body begins in the nursery, and is, I believe, one factor of the early gingivitis of the child which, later, develops into the septic periodontitis (badly named "pyorrhœa") of the adult. The inevitable congestion of the gingival margins very greatly lessens the resistance of these tissues to adverse influences.

I drew attention to this in a paper entitled "Primary Factors in the Causation of Gingivitis" read at a meeting of the Odontological Section of the Royal Society of Medicine on Feb. 22nd, 1915, and published in the Proceedings of the Royal Society of Medicine and also in the *British Journal of Dental Science* for May 1st, 1915. Hot food as a factor in causing cancer of the throat has been mentioned by Mr. Stuart Low in a paper on Cancer of the Throat in the *Practitioner* for August, 1917 (p. 127). No one would suggest that it is the only factor. But in the discussion of the ætiology of chronic diseases all factors, especially primary factors, must be considered.

It is an obvious fact worth attention that no wild animal can obtain food hotter than its own body; the habit of taking food hotter than the body is human and artificial.

I am, Sir, yours faithfully,

Llandrindod Wells, April 5th, 1919. R. ACKERLEY.

TREATMENT OF LUPUS VULGARIS WITH PICRIC-BRASS.

To the Editor of THE LANCET.

SIR,—I have read the communications of Dr. H. A. Ellis and of Mr. H. J. Gauvain in your issue of March 15th on this subject with much interest, and, while congratulating the writers on their excellent work, it seems only right to state that, judging by the photographs and descriptions of the

[1] THE LANCET, 1918, ii., 239.

cases, similar results can be obtained by pyrogallic and salicylic acids, which are selective remedies affecting only the diseased tissues, and commonly used by dermatologists in the treatment of lupus vulgaris. With reference to the simultaneous application of heliotherapeutic measures advocated by Mr. Gauvain, it may be mentioned that the late Professor Finsen of Copenhagen employed pyrogallic acid ointment to a large extent in combination with the light treatment which bears his name, and it was doubtless to the association of these two methods that he owed, in no small degree, his success in extensive cases of cutaneous tuberculosis.

I am, Sir, yours faithfully,

Harley-street, W., April 7th, 1919. S. ERNEST DORE.

THE FUTURE OF THE TUBERCULOSIS PROBLEM.

To the Editor of THE LANCET.

SIR,—I fear that Mr. P. C. Varrier-Jones, in his paper on the above subject in your issue of March 22nd, is inclined to take a somewhat one-sided view of this matter. There are more ways than one of approaching this problem. It is possible, as Mr. Varrier-Jones suggests, to attempt to segregate cases after they have become more or less advanced, which may be inferred from the stress he lays on treating these people for long periods in colonies, or, on the other hand, we may after much delay begin to treat early cases at sanatoriums before appreciable destruction of tissue has taken place. Anyone of experience knows that early cases treated at properly conducted sanatoriums do not necessarily break down speedily. Indeed, a forecast of the length of time required to treat any given case can be made from a consideration of the length of time the patient has been allowed to go about doing his work before being sent to a sanatorium. Treating all early cases is not only treating individuals, but is a means of saving whole families from becoming victims of this disease.

Mr. Varrier-Jones seems to have fallen into error when he states: "Our energies should be concentrated not so completely on the symptoms of the diseased—those who have well-defined symptoms and signs, in whom the lung tissue has broken down and by whom the bacilli are freely expectorated." The whole point of my contention is that symptoms which are quite easily noticed are often prominent months before the lungs are sufficiently injured to permit of a diagnosis being made by physical examination. We are at the parting of the ways, and have got to decide now whether we are going to follow the advice of Sir James Mackenzie (who has well stated his case in a recent number of the *Spectator*) and treat patients at a time when it is worth while, or continue to treat them when they are past cure. We might use as our motto a saying of Shakespeare:—

> A little fire is quickly trodden out;
> Which being suffered, rivers cannot quench.

This applies equally to the individual and the community.

I am, Sir, yours faithfully,

EDWARD E. PREST.

Ayrshire Sanatorium, New Cumnock, March 24th, 1919.

SACCHAROSE INJECTIONS IN PULMONARY PHTHISIS.

To the Editor of THE LANCET.

SIR,—In reply to Mr. J. Lavens West's letter in your issue of March 29th, the *British Medical Journal* of July 15th, 1918, p. 671, contains a note on this treatment, introduced by Professor Lo Monaco. The method consists of giving 5 g. of saccharose (cane sugar) in 5 c.cm. of sterilised distilled water daily, in one or two intramuscular injections. It is claimed that after three or four days the temperature falls, night-sweats cease, cough is very much lessened, and the amount of expectoration is greatly diminished. The method is still *sub judice*.—I am, Sir, yours faithfully,

HENRY CURTIS, F.R.C.S.,
Consulting Surgeon, National Sanatorium Association, London.

Harley-street, W., April 5th.

*** At a meeting of the Société de Thérapeutique held in Paris on Jan. 8th Dr. G. Rosenthal commented on Rénon and Mignot's recent communication, in which they stated that injections of saccharose had no action either on human tuberculosis or on the experimental disease in the guinea-pig (*vide* THE LANCET, March 15th, p. 424). This objection was only applicable to hypodermic injections, which, as Rosenthal had shown in a previous paper, did not possess much value. On the other hand, a daily intravenous injection of 5–20 c.cm. of Lo Monaco's solution (equal parts of saccharose and water) constituted an efficacious treatment in states of malnutrition, and indirectly had a favourable action on tuberculosis. The improvement was usually rapid, being well marked after 10–15 days' treatment.—ED. L.

WOMEN CHIEFS?

To the Editor of THE LANCET.

SIR,—Dr. W. C. Rivers will, I hope, forgive me for diagnosing his complaint as acute salicism. No doubt many women doctors are unsuited to command their male colleagues, but is this sufficient reason for excluding the few, whose administrative gifts are patent, from high appointments? We all know the stenophrenic male, with the mentality of a monkey and the spitefulness of an eunuch. Many of us also know the gifted woman with vision, tact, and administrative genius. If Dr. Rivers finds these types on the medical staff of a municipality does he suggest promotion of the former at the expense of the latter? And would he, courteously but firmly, tell the woman—

> "Though you are too weak to journey
> Up the mountain steep and high,
> You can stand within the valley
> While the multitudes go by"?

I am, Sir, yours faithfully.

April 7th, 1919. CLAUDE LILLINGSTON.

URBAN VITAL STATISTICS.

(Week ended April 5th, 1919.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at 16,500,000 persons, the annual rate of mortality, which had steadily declined from 35·7 to 19·3 in the five preceding weeks, further fell to 17·9 per 1000. In London, with a population slightly exceeding 4,000,000 persons, the annual death-rate was 17·1, or 0·5 per 1000 below that recorded in the previous week; among the remaining towns the rates ranged from 8·3 in Gillingham, 9·2 in East Ham, and 10·0 in Tynemouth, to 30·3 in Grimsby, 30·9 in Great Yarmouth, 32·3 in Hastings, and 34·5 in Middlesbrough. The principal epidemic diseases caused 194 deaths, which corresponded to an annual rate of 0·6 per 1000, and included 73 from measles, 40 from whooping-cough, 34 from diphtheria, 29 from infantile diarrhœa, 14 from scarlet fever, and 4 from enteric fever. Measles caused a death-rate of 2·1 in Sheffield, 7·3 in Rotherham, and 8·7 in Middlesbrough; and whooping-cough of 2·7 in Stoke-on-Trent. The deaths attributed to influenza, which had declined from 3839 to 888 in the five preceding weeks, further fell to 569, and included 91 in London, 56 in Birmingham, 34 in Manchester, 30 in Liverpool, and 27 in Sheffield. There were 6 cases of small-pox, 1031 of scarlet fever, and 1158 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 6, 1027, and 1163 respectively at the end of the previous week. The causes of 45 deaths in the 96 towns were uncertified, of which 8 were registered in Birmingham, 5 in Liverpool, and 4 in Manchester.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate of mortality, which had declined from 40·0 to 20·5 in the five preceding weeks, further fell to 18·5 per 1000. The deaths from influenza numbered 10, while in 59 deaths classified as due to other conditions influenza was a contributory cause; in the previous week these numbers were 14 and 88 respectively. The 419 deaths in Glasgow corresponded to an annual rate of 19·5 per 1000, and included 35 from whooping-cough, 9 from measles, 6 from infantile diarrhœa, and 5 from diphtheria. The 103 deaths in Edinburgh were equal to a rate of 16·7 per 1000, and included 10 from whooping-cough, 3 from diphtheria, and 1 from measles.

Irish Towns.—The 253 deaths in Dublin corresponded to an annual rate of 32·6, or 1·1 per 1000 above that recorded in the previous week, and included 41 from influenza, 4 from infantile diarrhœa, and 1 each from measles, whooping-cough, and diphtheria. The 168 deaths in Belfast were equal to a rate of 21·8 per 1000, and included a fatal case of infantile diarrhœa.

VITAL STATISTICS OF LONDON DURING THE YEAR 1918.

In the accompanying table statistics of sickness and mortality in the City of London and in each of the metropolitan boroughs are summarised for the year 1918. With regard to the notified cases of infectious diseases, it appears that the number of persons reported to be suffering from one or other of the ten diseases specified in the table was equal to a rate of 4·4 per 1000 of the population, estimated at 4,026,901 persons; in the three preceding years the rates were 7·1, 5·1, and 4·2 per 1000 respectively. Among the various boroughs the rates last year ranged from 2·4 in the City of Westminster, 2·5 in Chelsea, 2·7 in Hampstead, 2·8 in the City of London, 3·1 in Kensington, 3·3 in Hammersmith, 3·3 in St. Marylebone, and 3·4 in Holborn, to 5·2 in Greenwich, 6·2 in Stepney, 6·3 in Bermondsey, 7·3 in Bethnal Green, and 8·0 in Southwark. Thirty-five cases of small-pox were notified last year against 11, 1, and 0 in the three preceding years; of these, 24 cases belonged to Stepney. The prevalence of scarlet fever was about 12 per cent. more than in the preceding year; 6811 cases were notified, against 8766 and 6119 in the two preceding years. Among the metro-

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING THE YEAR 1918.

(Specially compiled for THE LANCET.)

CITIES AND BOROUGHS.	Estimated civil population, 1917.	Notified Cases of Infectious Disease.											Deaths from Principal Infectious Diseases.									
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cerebro-spinal meningitis.	Poliomyelitis.	Total.	Annual rate per 1000.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Enteric fever.	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.	Deaths from all causes.	Death-rate per 1000 living.
LONDON	**4,026,901**	**35**	**6811**	**8174**	**1**	**358**	**2**	**158**	**2006**	**218**	**50**	**17,813**	**4·4**	—	**1651**	**118**	**654**	**1688**	**79**	**1112**	**5302**	**1·3**	**74,623**	**18·6**
West Districts :																								
Paddington	122,507	—	150	261	—	13	—	2	55	3	—	484	4·0	—	40	1	20	51	1	24	137	1·1	2192	17·9
Kensington	151,535	—	222	174	—	11	1	4	48	14	—	474	3·1	—	13	7	11	36	—	43	110	0·7	2674	17·7
Hammersmith ...	114,982	—	172	138	—	15	—	7	37	11	—	380	3·3	—	44	2	6	28	3	32	115	1·0	1946	17·0
Fulham	145,126	—	229	207	—	15	—	12	45	8	2	518	3·6	—	46	4	12	58	4	60	184	1·3	2455	17·0
Chelsea	57,368	—	67	46	—	4	—	6	19	1	—	143	2·5	—	14	—	5	11	1	8	39	0·7	1040	18·9
City of Westminster	122,046	—	92	133	—	20	—	4	35	2	2	288	2·4	—	10	2	10	27	2	23	74	0·6	2023	16·6
North Districts :																								
St. Marylebone ..	92,796	—	78	158	—	9	—	6	46	4	3	304	3·3	—	12	—	10	26	2	33	83	0·9	1772	19·1
Hampstead	75,649	—	52	10	—	11	—	—	25	2	1	201	2·7	—	—	3	6	15	3	7	34	0·5	965	12·8
St. Pancras	186,600	—	330	396	—	17	—	5	114	8	2	872	4·7	—	70	7	32	88	9	47	249	1·3	3864	20·8
Islington	297,102	2	430	518	—	27	—	4	141	15	5	1142	3·9	—	113	9	42	150	7	69	390	1·3	5766	19·5
Stoke Newington...	47,426	—	49	110	—	1	—	1	15	4	—	180	3·8	—	8	—	18	4	3	7	40	0·8	795	16·8
Hackney	196,598	2	270	473	—	30	—	8	97	6	2	888	4·5	—	43	6	56	57	8	62	226	1·2	3641	18·6
Central Districts :																								
Holborn	55,303	1	23	81	—	2	—	—	10	1	1	119	3·4	—	6	—	5	13	3	10	37	1·1	820	23·3
Finsbury	68,011	—	167	121	—	2	—	1	26	3	—	320	4·7	—	44	3	10	53	—	15	125	1·8	1569	23·1
City of London ..	16,138	—	18	19	—	—	—	—	7	1	—	45	2·8	—	3	—	1	1	—	4	9	0·6	289	18·0
East Districts :																								
Shoreditch	89,675	—	156	192	—	5	—	3	89	4	1	450	5·0	—	82	—	12	95	1	61	251	2·8	2122	23·7
Bethnal Green ..	107,362	2	297	337	—	14	—	3	115	9	2	779	7·3	—	175	9	26	150	2	39	401	3·7	2477	23·1
Stepney	232,010	24	448	774	—	15	—	6	136	18	6	1427	6·2	—	147	5	57	94	6	83	392	1·7	4771	20·6
Poplar	143,443	2	251	306	—	12	—	12	94	9	4	670	4·7	—	150	3	31	67	1	49	301	2·1	3146	22·0
South Districts :																								
Southwark	167,936	—	653	502	—	8	1	12	150	7	—	1333	8·0	—	145	14	41	129	1	47	377	2·3	3757	22·4
Bermondsey	107,635	—	233	376	1	6	—	2	48	6	8	680	6·3	—	73	3	23	87	—	36	222	2·1	2401	22·4
Lambeth	272,038	1	525	438	—	13	—	17	97	16	1	1108	4·1	—	131	13	49	88	5	70	356	1·3	4972	18·3
Battersea	150,023	—	263	221	—	8	—	2	75	12	2	573	3·8	—	27	4	22	59	—	42	184	1·2	2767	18·5
Wandsworth	300,787	—	550	494	—	38	—	16	110	18	2	1228	4·1	—	44	3	34	57	5	76	219	0·7	4349	14·5
Camberwell	239,461	—	342	549	—	13	—	4	149	14	—	1071	4·5	—	85	5	36	86	4	61	277	1·2	4224	17·7
Deptford	103,527	1	192	232	—	14	—	2	69	4	2	516	5·0	—	20	3	12	53	2	21	111	1·1	1809	17·5
Greenwich	90,440	—	166	244	—	14	—	1	42	3	1	471	5·2	—	45	1	16	45	4	30	141	1·6	1710	19·0
Lewisham	161,406	—	200	320	—	6	—	5	54	6	1	592	3·7	—	10	7	33	31	4	20	105	0·7	2196	13·6
Woolwich...	131,942	—	213	241	—	13	—	13	58	9	2	549	4·2	—	21	4	24	29	2	33	113	0·9	2071	15·7
Port of London ...	—	—	3	3	—	2	—	—	—	—	—	8	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup.

politan boroughs the greatest proportional prevalence of this disease was recorded in Finsbury, Bethnal Green, Stepney, Southwark, Bermondsey, and Lambeth. The Metropolitan Asylums Hospitals contained 1087 scarlet fever patients at the end of last year, against 913 and 1246 at the end of the two preceding years; 6676 new cases were admitted during the year against 8542 and 6056 in the two preceding years. Diphtheria was slightly less prevalent than it had been in the preceding year; 8174 cases were notified as compared with 8754 and 8300 in the two preceding years. This disease was proportionally most prevalent in Hackney, Bethnal Green, Stepney, Southwark, Bermondsey, and Greenwich. The number of diphtheria patients remaining under treatment at the end of last year in the Metropolitan Asylums Hospitals was 1089, against 1479 and 1656 at the end of the two preceding years; the number of cases admitted during the year was 8256, against 8683 and 8554 in the two preceding years. The prevalence of enteric fever was considerably less than it had been in other recent years, 358 cases being notified against 779, 647, 463, and 452 in the four preceding years. The greatest proportional prevalence of this disease was recorded in the City of Westminster, Hampstead, Hackney, Deptford, and Greenwich. The number of enteric fever patients admitted into the Metropolitan Asylums Hospitals during the year was 242, against 470, 446, 324, and 271 in the four preceding years; 23 cases remained under treatment at the end of the year, against 68, 50, 37, and 32 at the end of the four preceding years. The greatest proportional prevalence of erysipelas occurred in St. Pancras, Shoreditch, Bethnal Green, Poplar, Southwark, Camberwell, and Deptford. The 158 cases of puerperal fever notified during the year included 17 in Lambeth, 16 in Wandsworth, 13 in Woolwich, 12 in Fulham, 12 in Poplar, and 12 in Southwark. The 218 cases of cerebro-spinal meningitis included 18 in Stepney, 18 in Wandsworth, 16 in Lambeth, 15 in Islington, 14 in Kensington, 14 in Camberwell, 12 in Battersea, and 11 in Hammersmith; while of the 50 cases of poliomyelitis 8 belonged to Bermondsey, 6 to Stepney, 5 to Islington, 4 to Poplar, and 3 to St. Marylebone.

The mortality figures in the table relate to deaths of persons actually belonging to the various metropolitan boroughs, and are obtained by distributing the deaths in institutions among the boroughs in which the deceased persons had previously resided. During the 52 weeks ended Dec. 28th last the deaths of 74,623 London residents were registered, equal to a death rate of 18·6 per 1000; in the three preceding years the rates had been 16·1, 14·3, and 14·7 per 1000. The lowest death-rates last year were 12·8 in Hampstead, 13·6 in Lewisham, 14·5 in Wandsworth, 15·7 in Woolwich, 16·6 in the City of Westminster, and 16·8 in Stoke Newington; the highest rates were 22·4 in Southwark, 22·4 in Bermondsey, 23·1 in Finsbury, 23·1 in Bethnal Green, 23·3 in Holborn, and 23·7 in Shoreditch. The deaths from all causes included 5302 which were referred to the principal infectious diseases; of these, 1651 resulted from measles, 118 from scarlet fever, 654 from diphtheria, 1688 from whooping-cough, 79 from enteric fever, and 1112 from diarrhœa and enteritis among children under 2 years of age. The death-rate from these diseases in the aggregate ranged from 0·5 in Hampstead, 0·6 in the City of Westminster, 0·6 in the City of London, and 0·7 in Kensington, Chelsea, Wandsworth, and Lewisham, to 2·1 in Poplar, 2·1 in Bermondsey, 2·3 in Southwark, 2·8 in Shoreditch, and 3·7 in Bethnal Green. The 1651 fatal cases of measles were 43 more than the average number in the five preceding years; this disease was proportionally most fatal in Finsbury, Shoreditch, Bethnal Green, Stepney, Poplar, Southwark, and Bermondsey. The 118 deaths from scarlet fever were 95 below the average number; the greatest proportional mortality from this disease was recorded in Kensington, Bethnal Green, Southwark, and Lambeth. The 654 fatal cases of diphtheria were 50 in excess of the average number; this disease showed the greatest proportional mortality in Stoke Newington, Hackney, Bethnal Green, Stepney, Poplar, and Southwark. The mortality from whooping-cough was double the average in the five preceding years; 1688 deaths were registered during the year, against an average of 847. The highest death-rates from this disease were recorded in Finsbury, Shoreditch, Bethnal Green, Southwark, and Bermondsey. The 79 deaths from enteric fever were 31 fewer than the average number, and included 8 in Hackney, 7 in Islington, 6 in Stepney, 5 in St. Pancras, 5 in Lambeth, and 5 in Wandsworth. The mortality from diarrhœa and enteritis among children under 2 years of age was less than half the average, the deaths numbering 1112, against an average of 2355; the fatality from this disease was greatest in Fulham, St. Marylebone, Shoreditch, Bethnal Green, Stepney, Poplar, and Bermondsey. In conclusion, it may be stated that the aggregate mortality in London last year from these principal infectious diseases was 7·5 per cent. below the average.

MEDICAL SICKNESS, ANNUITY, AND LIFE ASSURANCE FRIENDLY SOCIETY.—The thirty-sixth report and statement of accounts of this society dealing with the year ending December, 1918, states that the increase of registered medical women has led the committee to consider the advisability of bringing out a scheme of sickness insurance for them, the conclusion being that it would be in the best interest of the society and the profession generally to undertake this class of insurance. The sickness and accident fund account shows that the amount of premiums received was £23,354, the claims paid amounted to £20,539 and the bonuses paid at the age of 65 or previous death £2436. The total of this fund at the end of the year was £179,067 6*s.* 4*d.* Of the total of 854 claims paid 320 were for influenza. Details are given of the annuity fund, which amounted at the end of the year to £71,295 17*s.* 6*d.*, and of the life insurance fund, which amounted to £22,456 5*s.* 7*d.* The average net rate of interest earned on the funds was £4 8*s.* per cent. It may be mentioned that the society subscribes 100 guineas a year to Epsom College, the votes thus obtained being used for the benefit of members of the society or their families. The society also subscribed the sum of 50 guineas to the Royal Medical Benevolent Fund and a like sum to the War Emergency Fund of that institution.

THE SERVICES.

ARMY MEDICAL SERVICE.

Temporary Colonels relinquishing their temporary commissions on re-posting: F. D. Boyd (Major, R.A.M.C., T.F.), J. M. Cowan, W. E. Hume.

Temp. Col. T. R. Elliott relinquishes his commission and retains the rank of Colonel.

Temp. Majors C. H. Miller and W. P. S. Branson and Temp. Capt. F. Fraser to be temporary Colonels.

Capt. (acting Major) H. Burrows, R.A.M.C., T.F., to be temporary Colonel.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. W. R. P. Goodwin to be Acting Colonel whilst specially employed.

Lieut.-Col. F. W. Hardy retires on retired pay on account of ill-health contracted on active service.

Majors H. Rogers and C. M. Drew relinquish the acting rank of Lieutenant-Colonel on re-posting.

Majors to be Acting Lieutenant-Colonels: C. M. Drew, whilst in command of a Medical Unit), R. V. Cowey (whilst specially employed).

Major M. C. Wetherell retires, receiving a gratuity, on account of ill-health contracted on active service, and is granted the rank of Lieutenant-Colonel.

Temporary Majors (acting Lieutenant-Colonels) relinquishing their temporary and acting ranks on re-posting: C. V. Bulstrode (Major, Shrops. R.H.A., T.F.), L. C. Bruce (Captain, R.A.M.C., T.F.).

Temp. Major (acting Lieut.-Col.) W. H. Merritt, Can. A.M.C., relinquishes the acting rank of Lieut.-Colonel on ceasing to be employed at Can. Spec. Hospital, Etchinghill.

To be acting Majors whilst specially employed: Capt. J. S. McCombe, Temp. Capts. A. H. M. Robertson and P. L. Watkin-Williams.

The undermentioned relinquish the acting rank of Major on re-posting: Capts. A. R. Wright, T. H. Balfour, R. H. Leigh, A. C. Jebb, P. J. Ryan. Temp. Capts: S. E. Martin, J. Greene, A. L. Lockwood, A. R. Esler, A. Ryland, R. Tindall, J. A. Conway, H. R. Evans, P. L. Blaber, D. E. Crosbie, H. B. Walker, W. E. Gemmell, S. G. Luker, M. J. Mottram, A. Gray, V. M. Rich, I. S. Wilson, C. H. Haddow.

To be acting Majors: Capts. T. A. Weston, R. S. Armour, O. C. Link, H. F. Mullan, R. B. Heygate, E. W. Sheaf, F. H. Young, J. D. MacEwen, L. P. Lewon (while specially employed).

Temp. Capt. (acting Major) F. B. Bowman, Canadian A.M.C., ceases to be seconded for duty with the War Office.

Temp. Capt. D. H. Paterson, Canadian A.M.C., retires in the British Isles.

Lieut. (temp. Capt.) J. W. G. H. Riddel to be Captain.

Temporary Lieutenants to be temporary Captains: T. W. Shaw, C. P. Chambers, J. C. Curtis, E. Gofton, G. Maclean, T. G. Rothwell, W. S. Perrin, R. L. Hughes, R. H. Martin, R. Harrington, S. Broderick, H. J. Knox, H. N. Crossley, P. B. Whitington, J. F. Paul, J. F. Jennings.

Temp. Lieut. A. W. Hare to be temporary Captain.

Officers relinquishing their commissions:—Temp. Lieut.-Cols. R. J. Morris, J. Trimble, G. A. Wright (and retain the rank of Lieutenant-Colonel), T. E. Sandal. Temporary Majors retaining rank of Major: J. B. Stephens, J. N. Sergeant, on ceasing to be employed at the Great Ballard Hospital. Temporary Major granted rank of Lieutenant-Colonel: N. H. Mummery. Temporary Captains granted the rank of Major: E. E. Herga, M. C. Gardner, C. E. Sundell, J. D. Cooke, H. G. Kilner, C. C. Forsyth, D. E. Crosbie, E. L. Dobson, A. E. Seller, J. A. Conway, M. J. Mottram, M. W. Littlewood, C. A. Brisco, R. Tindall, E. G. Stanley. Temporary Captains retaining the rank of Captain: I. C. Edwards, H. G. White, J. A. Valentine, H. T. Thomson, I. J. Williams, C. Aldis, V. H. Blake, I. B. Davies, H. P. Crampton, W. H. Butler, A. J. W. Cunningham, P. G. Foulkes, C. G. Colyer, J. C. Scott, O. E. Ward, J. E. Frere, W. Turner, L. D. Stamp, F. Talbot, M. White, J. C. Walker, M. C. Stark, F. P. Young, J. R. Scott, D. B. Davidson, A. E. M. Woolf, F. D. Scott, H. Gooch, R. Cox, G. C. Adeney, N. R. Ussher, G. H. Shaw, S. H. Scott, L. Bathurst, C. R. Wilkins, A. L. White, F. Stevenson, G. Viner, A. F. S. Sladden, C. L. Forde, H. J. Van Praagh, H. F. Woods, L. L. Fyfe, W. J. Smyth, R. N. Dunlop, A. G. Ede, K. McK. Duncan, G. I. Cumberlege, A. M. Laurie, G. L. Parsons, T. Drysdale, M. Colte, N. Garrard, A. H. Porter, L. H. Burner, W. A. Elwood, N. E. Sampey, J. B. Cunningham, S. G. Corner, C. E. Clay, F. H. Flack, W. H. Eggar, J. B. Banister, R. Fraser, R. W. Pearson, J. A. Berlyn, A. Fleming, D. L. Carmichael, W. K. Bell, G. Birch, F. E. L. Phillips, J. E. Payne, J. E. MacFarlane, P. S. Hunter, J. H. Kay, H. E. Batten, K. J. A. Davis, J. K. Willis, A. D. Millington, R. Franklin, A. G. Jenner, B. Graves, A. Morgan, W. B. Blandy, E. S. Molyneux, R. E. Barrett, E. B. S. J. Galbraith, S. K. Hutton, L. H. Butler, J. M. Taylor, J. Dunbar, H. F. Bellamy, E. B. Collings, A. G. Wilkinson, M. E. Delafield, H. Fulham-Turner, P. Gully, W. W. Banham, C. J. W. Clayton, J. H. Aikman, J. A. Aitken, C. H. T. Ilott, G. A. Smythe, G. Wacher, F. M. Harvey, W. Salisbury, J. F. Bullar, T. A. Fall, S. A. Boyd, F. B. McCarter, E. J. Storer, W. G. E. Allen, W. F. Stevenson, A. J. Lewis, H. K. Macdonald, J. Brown-Sim, C. King, A. R. Finn, L. S. H. Glanville, J. H. Mason, J. R. McGilvray, L. Levene, C. A. Dottridge, J. R. Murray, M. Eager, W. F. Gibb, W. H. McWalter, R. H. Cox, E. B. Jardine, F. Hartley, A. C. Mann, A. B. Howitt, W. P. Jones, W. H. Laslett, E. S. Gooddy, G. McGregor, H. M. Stephenson, P. A. Doyle, S. Southall, J. E. Sandilands, W. J. I. Dwyer, M. Turnbull, H. Spinks, A. Scott, H. H. Stones, E. E. Cassaday, J. W. Innes, O. Shields, C. J. Brookes, A. R. Snowdon, H. G. Wiltshire, F. A. M. Flegge, A. Mills, F. W. O'Connor, M. MacKenzie, A. J. Turner, B. Robertson, O. J. F. C. Greenidge, F. L. Sessions, C. G. Pugh, J. Lumb, P. M. Reid, T. P. Seymour, T. S. D. Enderby, C. G. Timms, R. A. Eastmond, C. M. Stallard, J. D. Pearson, J. E. McCartney, H. N. Matthews, E. H. Noney, C. C. Morgan, E. C. MacKay, T. H. Harker, A. T. Marshall, E. Tate, P. K. Muspratt, D. N. Knox, J. P. Shaw, A. J. May, H. B. Wickham, J. M. Young, W. W. Fyfe, J. S. Part, H. S. McLellan, R. T. Martin, G. L. Gall, J. B. Lester, J. E. Spence, A. M. Mitchell, J. K. Watson. Temporary Lieutenants retaining the rank of Lieutenant: H. M. Raphael, W. E. Martin, T. G. Playford, R. R. MacGregor, E. D. Kinsey, N. McCullough, R. Walker, R. W. Gilmour, G. Holman, C. Fletcher, R. F. McN. Scott, W. Anderson, C. M. Smith. Temp. Hon. Lieut. A. H. Miller, and retains the honorary rank of Lieutenant.

SPECIAL RESERVE OF OFFICERS.

Capt. W. H. Elliott to be acting Lieutenant-Colonel whilst in command of a Medical Unit.

Capt. J. Paulley relinquishes the acting rank of Major on re-posting.

Captains to be acting Majors whilst specially employed: H. W. Hills, F. M. Taylor, P. A. Clements.

Capts. T. H. Davis, M.C., and J. J. A. Scott relinquish their commissions and retain the rank of Captain.

W. Y. Eccott, from University of Edinburgh contingent, O.T.C., to be Lieutenant.

1st Scottish General Hospital: Capt. (acting Major) H. E. Smith relinquishes his acting rank on ceasing to be specially employed.

2nd Southern General Hospital: Capts. (acting Majors) C. A. Moore and A. G. T. Fisher relinquish their acting rank on ceasing to be specially employed and remain seconded.

4th Northern General Hospital: Capt. (acting Major) F. E. Withers relinquishes his acting rank on ceasing to be specially employed and remains seconded.

4th London General Hospital: Capt. I. G. Back is restored to the establishment.

2nd Western General Hospital: Capt. J. P. Buckley is restored to the establishment.

3rd Southern General Hospital: Capt. T. B. Marshall is restored to the establishment.

1st London Sanitary Company: Capt. J. Teare to be Major. Capt. D. J. Peebles relinquishes his commission on account of ill-health contracted on active service, and retains the rank of Captain. Lieuts. E. L. Gaunt and W. D. Dick to be Captains.

2nd Northern General Hospital: Major J. K. Jamieson to be acting Lieutenant-Colonel whilst specially employed, and is seconded.

4th London Field Ambulance: Capt. (acting Lieut.-Col.) T. B. Layton, relinquishes his acting rank on ceasing to be specially employed.

3rd Southern General Hospital: Capt. G. F. Murrell is restored to the establishment.

2nd London Sanitary Company: Capt. D. H. Burleigh is restored to the establishment.

1st Eastern General Hospital: Capt. S. W. Curl is restored to the establishment.

2nd Scottish General Hospital: Major (acting Lieut.-Col.) D. J. Graham relinquishes his acting rank on ceasing to be specially employed. Major D. J. Graham to be Lieutenant-Colonel.

3rd Scottish General Hospital: Major J. M. Cowan is restored to the establishment.

TERRITORIAL FORCE.

Lt.-Col. (acting Col.) T. Fraser relinquishes his acting rank on vacating the appointment as Assistant Director of Medical Services.

Lieut.-Col. S. G. Barling is seconded whilst holding a temporary commission in the Army Medical Service.

Major (acting Lieut.-Col.) G. W. Miller relinquishes his acting rank on ceasing to be specially employed.

Captains (acting Lieut.-Cols.) relinquishing their acting rank on ceasing to be specially employed: J. D. Fiddes, D. J. Scott, C. W. Eames, A. J. Williamson.

Captains (acting Majors) relinquishing their acting rank on ceasing to be specially employed: H. Drummond, J. Graham, R. Henry, S. J. C. Holden, A. E. Huxtable, F. S. Jackson, H. J. A. Longmore, W. F. Young, J. H. Blackburn, C. N. Smith, W. T. Ritchie, W. H. Morrison, M. S. Doubble, W. G. McKenzie, A. Cambell, I. C. Marshall, C. A. Raison, F. A. Roper.

Captains T. B. Layton and H. A. Sandiford to be acting Majors whilst specially employed.

ROYAL AIR FORCE.

Medical Branch.—Capt. J. W. Tyrrell (acting Lieut.-Col., R.A.M.C.), is granted a temporary commission as Lieutenant-Colonel.

Captain C. F. A. Hereford to be Major.

The undermentioned are granted temporary commissions as Lieutenants: R. H. Parry, R. I. Rhys, J. Kyle.

The undermentioned are transferred to unemployed list: Capts. T. B. Dixon, P. W. McKeag, D. Guthrie, S. W. Fisher, W. F. Jones, A. G. H. Smart, T. E. Mulvany, W. L. Scott, A. S. Glegg, H. Stedman (acting Major), R. G. Maglione, A. L. Dykes; Lieuts. E. L. Bunting, G. A. Simmons.

Capt. J. W. Brash (R.A.M.C., Spec. Res.), relinquishes his commission on account of ill-health.

Medical (Administrative) Branch.—Capt. H. R. B. Hull to be acting Major whilst specially employed.

Dental Branch.—Lieut. D. H. W. Williamson to be Captain.

Lieut. A. E. F. Peaty is transferred to Unemployed List.

INDIAN MEDICAL SERVICE.

Bt. Col. H. F. Cleveland to be Colonel.

Lieut. Col. J. B. Smith to be Colonel.

Major D. C. Kemp to be Lieutenant-Colonel.

THE INDIAN MEDICAL SERVICE DINNER.

It has been decided to resume the annual dinner in London of the officers of the Indian Medical Service. The dinner will be held this year at the Trocadero on Wednesday, June 11th. Further information can be obtained from Colonel J. J. Pratt, I.M.S. (retd.), 63, Addison-road, Kensington, W. 14.

DEATHS IN THE SERVICES.

The death from heart failure is announced of Lieut.-Col. J. G. Hojel, C.I.E., I.M.S. He joined the service in 1888 and was appointed resident surgeon of St. George's Hospital at Bombay in 1895. In 1906 he was appointed to the Gokuldas Tejpal Hospital in Bombay. During the war he was in charge of the Lady Hardinge Hospital for Indian Troops in Bombay and also of the Gerard Freeman-Thomas War Hospital.

Medical News.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the Second Professional Examination in Anatomy and Physiology held on March 27th, 28th, and 31st, and April 1st, 82 candidates presented themselves, of whom 57 were approved and 25 were rejected. The following are the names and medical schools of the successful candidates:—

A. B. Aldred, Guy's Hosp.; Charlotte Katherine Jocelyn Almond, King's Coll.; T. J. D. Atteridge, St. Bart.'s Hosp.; W. E. Barnes, Univ. Coll.; A. O. Bekenn, Birmingham Univ.; H. G. R. Canning, Guy's Hosp.; Linda Catmur, Lond. Sch. of Med. for Women; E. C. T. Clouston and I. J. Corbett, London Hosp.; E. C. Dodds, Middlesex Hosp.; B. Dous, King's Coll.; J. C. Evans, London Hosp.; W. W. J. Fernando, Middlesex Hosp.; H. S. Forbes, Univ. Coll.; Lydia Susan Fuller-Maitland, Lond. Sch. of Med. for Women; J. H. Gann, London Hosp.; H. Geary, Manchester Univ.; S. Gordon, Cardiff and St. Bart.'s Hosp.; L. D. Gorton, Birmingham Univ.; J. B. Gregor, Guy's Hosp.; E. F. Griffith, St. Mary's Hosp.; A. Hamid, King's Coll.; A. G. Hammond, Middlesex Hosp.; E. B. Isaacs, Univ. Coll.; E. R. Jagger, Manchester Univ.; R. Jones, Birmingham Univ.; A. N. Kingsbury, Middlesex Hosp.; G. Kinneir, St. Bart.'s Hosp.; G. B. Kirkland, Guy's Hosp.; Emilia Bertha Marie Krause, London Hosp.; F. I. Labieb and E. G. Lewis, King's Coll.; A. N. Macbeth, Univ. Coll.; J. S. McNair, Middlesex Hosp.; S. P. Meacock, Cardiff and Guy's Hosp.; J. C. R. Morgan, Univ. Coll., Cardiff; Beatrice Mary Niven, Liverpool Univ.; Mary Eleanor Ormsby and Ruth Emerita Pilgrim, Lond. Sch. of Med. for Women; P. R. Rashbrook, London Hosp.; F. L. Rayner, Guy's Hosp.; Dorothy Worsley Roughton and Ena Mildred Sansom, Lond. Sch. of Med. for Women; G. Fraser-Smith, Middlesex Hosp.; J. Solomonoff, London Hosp.; Mary Agnes Elizabeth Somers, Bristol Univ.; Marjorie Perrers Taylor, King's Coll.; C. P. Thomas, Univ. Coll., Cardiff; D. D. C. Thomson, London Hosp.; A. W. Tibbetts, Birmingham Univ.; W. J. G. Walker, Univ. Coll.; B. G. Watson, Birmingham Univ.; L. K. Watson, Guy's Hosp.; Elizabeth Naomi Wells, King's Coll.; J. Whitby, Middlesex Hosp.; W. H. Williams, Charing Cross Hosp.; and B. C. Woodroffe, Guy's Hosp.

At the quarterly examination in Practical Pharmacy held on April 3rd the following candidates were approved:—

S. T. Barrett, Cambridge Univ. and Guy's Hosp.; W. R. Bennett, Liverpool Univ.; W. H. Cellier, Guy's Hosp.; A. M. Cotes, Manchester Univ.; Edith Margery Pearce Davies, Lond. Sch. of Med. for Women; W. Göthe, Middlesex Hosp.; F. R. Hall, St. Thomas's Hosp.; Mabel Marian Ingram, Lond. Sch. of Med. for Women; C. R. McClure, Lond. Hosp.; O. T. Maclaren, Guy's Hosp.; J. Morgan, Univ. Coll., Cardiff; W. G. Owen, London Hosp.; George Packham and F. J. Smith, Guy's Hosp.; G. C. Thornton, Birm. Univ.; W. G. Tillake, Cambridge Univ. and Univ. Coll. Hosp.; R. A. Walker, St. Thomas's Hosp.; and Octavia Margaret Wilberforce, Lond. Sch. of Med. for Women.

UNIVERSITY OF DURHAM: FACULTY OF MEDICINE.—At the Convocation held on March 29th the following degrees were conferred:—

Doctor of Medicine (Essay).—John Hamilton Barclay.
Doctor of Medicine for Practitioners of 15 Years' Standing.—Geoffrey Lucas.
Master of Surgery.—Thomas Albert Hindmarsh.
Bachelor of Medicine and Bachelor of Surgery.—Douglas George Patrick Bell, John Maurice Brydson, Iris Marjorie Cheeseright, Samuel Foskett, Patrick Hickey, John Parkinson Higham, and Hans William Walther.
Diploma in Public Health.—Joseph Miller Gordon Ewing.

UNIVERSITY OF GLASGOW.—The following degrees were conferred on April 4th:—

Bachelors of Medicine and Bachelors of Surgery (M.B., Ch.B.).—Alexander Shanks Bisset, Alexander Black, John Bradford, Mary Turner Liddell Clark (with commendation), John Donald (with honours), Charlotte Ann Douglas, John Campbell Dow, Margaret Hogg Grant, James Anthony Hamilton, John Hewitt (withcommendation), Helen Hogg, Samuel Hamow Wolf Kamerasse, Robert Ebenezer Kerr, Archibald Campbell Lindsay, Robert Tweedie M'Gibbon, Walter Stewart M'Intyre, George Macleod Millar, Archibald Stewart Miller, Modiri Silas Molema, William Brodie Moore, Georgina Murdoch (with commendation), James Alphonsus O'Connor, John William Peden (with honours), John Pollock, James Morrison Ritchie (with commendation), Jane Elder Shortt, Muriel Amy Stowe, Harold Douglas Wallace, Robert Kennedy Watt.

UNIVERSITY OF DUBLIN, TRINITY COLLEGE. SCHOOL OF PHYSIC.—At examinations held recently the following candidates were successful:—

FINAL MEDICAL EXAMINATION.

Part I., Materia Medica and Therapeutics, Medical Jurisprudence and Hygiene, Pathology.—Eric Henry Cooke Allen (high marks), Adrian Johannes Louw Snijman (high marks), James Alexander Smith (high marks), Frederick Ziervogel van der Merwe (high marks), Herbert Victor Exner (high marks), Janie Millar Cummins (high marks), Isaac Levy, Edward Haslett Frazer, Johannes Cornelius Coetzee, and Lionel Wigoder (equal), Moira Mary Brown, Eric William Swain Deale, John Richard Waugh, and Thomas Madill.
Pathology (completing examination).—Percival Israel Levitt and Frederick William Robertson.
Materia Medica and Therapeutics, Medical Jurisprudence and Hygiene.—Patrick Joseph Healy.
Part II., Medicine.—Algar Read Aldin (high marks), Frederick Joseph Smith, Albert Hugh Thompson, Rita Henry, Gertrude Rice, Alewyn Johannes Vorster, Reuben Resnekov, Jan Jacobus Gabriel de Kock and John Edmund Hill (equal), Alfred Leopold Wilson, John Henry Coolican, Francis John Gerrard Battersby, and Patrick Casey.
Surgery.—Cyril Daniel Brink, John Charles Joseph Callanan, Robert Bevan Nangle Smartt, Algar Read Aldin, Victor George Walker and Alfred Leopold Wilson (equal), Jan Jacobus Gabriel de Kock and Reuben Resnekov (equal), Johannes Tobias Mynhardt, Mary Christina Sheppard, and Henry Blundell van der Merwe, Francis John Gerrard Battersby and Gerald Fitzmaurice Keatinge (equal).
Midwifery.—Richard Counihan (high marks); Charles John de Vere Shortt (high marks), Jan Jacobus Gabrie de Kock, Victor George Walker, Reuben Resnekov and John Farneworth Sheppard (equal), Arthur Isaac Steyn, Athanas Blagoff, Alewyn Johannes Vorster, and Jessie Gilbert.
Final Dental Examination.—Irene Olive Dorman.

DIPLOMA IN PUBLIC HEALTH.

Part I., Bacteriology, Pathology, Chemistry, Physics, and Meteorology.—John William Scharff and Robert Condy.
Part II., Sanitary Engineering, Vital Statistics, and Public Health, Hygiene and Epidemiology.—Harold Saunderson Sugars and John William Scharff.

LONDON SCHOOL OF TROPICAL MEDICINE.—The following passed the examination of this school at the termination of the fifty-ninth session (January-April, 1919):—*M. F. Sorour, *H. J. Smyly, E. St. J. Seelly, H. U. Leembruggen, V. B. Kyle, and J. B. Bostick.

* With distinction.

ROYAL INSTITUTION.—A general meeting of the members of the Royal Institution was held on April 7th, Sir James Crichton-Browne, treasurer and vice-president, in the chair. The decease of Sir James Mackenzie Davidson, a member and a manager of the Royal Institution, was announced, and a resolution of condolence with Lady Mackenzie Davidson and the family was passed.

THE Bleachers' Association has offered to the Bolton Infirmary a house at Watermillock, on the outskirts of the town, which has been used as a hospital for wounded soldiers. The value of the property is about £40,000.

THE second Silvanus Thompson Memorial Lecture will be delivered before the Rontgen Society by Professor W. M. Bayliss, on Tuesday, May 6th, at 8 P.M., in the Barnes Hall of the Royal Society of Medicine, 1, Wimpole-street, London, W.

POST-GRADUATE INSTRUCTION IN VENEREAL DISEASES.—A comprehensive post-graduate course in this subject has been arranged by the London School of Medicine for Women, the Royal Free Hospital, the Elizabeth Garrett Anderson Hospital, and the London Lock Hospital for the instruction of qualified medical women. The course will be held from Monday, May 19th, to Saturday, May 31st, the times of instruction, visits to wards and clinics, injections, and pathological laboratory work varying from day to day. Dr. O. T. Dinnick will lecture on modern treatment, visits to wards and out-patient clinics will be made under the direction of Mr. Charles Gibbs, Dr. Edith Green, Dr. Morna Rawlins, and Mr. Arthur Shillitoe, and the pathological laboratory work will be conducted by Dr. Kathleen Armstrong and Dr. Mary Schofield. The fee for the full course is 5 guineas, payable on entry, and qualified medical women wishing to attend are requested to send in their names to the warden and secretary at the school, 8, Hunter-street, London, W.C.1, not later than seven days before the course begins. It is proposed to repeat the course twice a year if a sufficient number of medical women enter.

THE MIDDLESEX HOSPITAL.—At a meeting of the court of governors of the Middlesex Hospital on March 27th, it was stated that the hospital would be closed for three months from July 1st. This step is being taken with the greatest reluctance. It was found to be necessary to overhaul the engineering plant completely, which could only be done if the hospital were closed. The difficulty with which the governors of the hospital were faced is one which will sooner or later occur to many similar large institutions in the country owing to the stress of war conditions and the inability to carry out necessary repairs, alterations, and cleaning. This will be more necessary when the buildings are of some age, where any attempt to carry out such fundamental work in a hospital without closing entirely must of necessity involve discomforts and possibly risks to patients and staff. It is understood that the hospital authorities are making adequate arrangements for the care of their patients and for the work of their students. The Cancer Charity, for example, will transfer its patients to the branch hospital at Clacton—a decision upon which the authorities may be congratulated, as it would have been a misfortune for so special a charity to be in abeyance even for a period of three months.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Nurses' Registration Bill.

WHEN the Nurses' Registration Bill was being again considered by the Standing Committee, Dr. NATHAN RAW moved an amendment to the effect that on the first constitution of the General Nursing Council there should be 36 persons, three each appointed by the Councils of the British Medical Association, the Medico-Psychological Association, the Association of Poor-law Unions, and the British Hospitals Association; and 12 each by the Central Committee for the State Registration of Nurses and by the Council of the College of Nurses; and further, that the persons so appointed should hold office until they had framed rules regulating the admission to the register of persons already in practice as trained nurses at the beginning of the Act and until the register of persons so entitled to be registered contained the names of not fewer than 20,000 persons, whereupon an election of direct representatives of registered nurses should be held and the persons appointed as above should cease to hold office. Following Dr. ADDISON'S suggestion that the question of the constitution of the Council should be considered by the Government Departments concerned and the medical and nursing associations, Dr. RAW withdrew his amendment.

Scottish Board of Health Bill.

The Scottish Board of Health Bill was considered on Tuesday, April 8th, by the Scottish Grand Committee of the House of Commons. Mr. A. RENDALL was in the chair. An amendment moved by Mr. W. GRAHAM, the effect of which was to appoint a separate Minister of Health for Scotland, was negatived on a division by 28 votes to 12.

Major MCMICKING moved an amendment to Clause 2, which deals with the general powers and duties of the Scottish Board of Health, to the effect that the power of initiation and direction of research should not include experiments under the Cruelty to Animals Act, 1876.—Sir WATSON CHEYNE pointed out that research did not always mean experiments on animals. The chief kind of research which would take place in connexion with this Bill would be sociological research. But he could not see how they were to make progress unless they continued to make use of the results obtained from research. Research would be the eyes of the Department, just as the aeroplane was the eyes of the Army. The man in the laboratory, or in other departments of research, enabled them to focus their energies so that they knew what to do. It was very important in the interests of diagnosis that animals should be used for experiment. There were certain diseases which might spread unless information was obtained by such means. Therefore he did not think that this was a proposal which could be accepted at all. Mr. MUNRO submitted that whether Major MCMICKING'S proposal was right or wrong this was not the time or the place to settle this question. The amendment would not prevent these experiments being carried on under the existing law of the country, and therefore it would be nugatory. The amendment was negatived.

On Clause 3, which deals with the constitution of the Board, Mr. MUNRO agreed that the Parliamentary Under Secretary to be appointed should be a Parliamentary Under Secretary for health purposes.

The Scottish Grand Committee of the House of Commons concluded the consideration of the Scottish Board of Health Bill on Wednesday, April 9th, Mr. A. RENDALL was in the chair. The debate was continued on the amendment proposed on Tuesday by Sir JOHN HOPE to transfer to the new Board of Health the powers of the Scottish Education Department with respect to attending to the health of children attending nursery schools, and all the powers and duties of the Scottish Education Department with respect to the medical inspection and treatment of children and young persons.—Sir WATSON CHEYNE said that it appeared to him that the treatment of young children should be under the care of the new authority from the very beginning, and that the transfer should take effect as soon as possible.—Mr. MUNRO (Secretary for Scotland) resisted the amendment, which, he urged, would accomplish nothing. There were no departmental or statutory powers in regard to medical treatment. Medical inspection was in a slightly different position, because under the Act of 1908 medical inspection was carried out, not by the Education Department, but by the local education authorities. He quite recognised the strength of view in the Committee in favour of something being done on the lines of the amendment in view of what had been done in the English Bill. He proposed that if the amendment was withdrawn, he would undertake to reconsider the matter before the Report stage and endeavour to find some method, either by a time limit or otherwise, to meet the view suggested.—Sir JOHN HOPE agreed to withdraw his amendment.

Mr. W. GRAHAM moved an amendment to Clause 4, which would transfer to the new Board all or any of the powers and duties of the Minister of Pensions with respect to the health of disabled officers and men after they had left the service, so far as those powers related to Scotland.—Mr. MUNRO said it was impossible for him to accept an amendment taking away from the Pensions Minister powers which he would continue to exercise in England. He saw no advantage which would result from the immediate transfer of functions which were being well discharged by the Minister of Pensions. The amendment was withdrawn.

Sir JOHN HOPE moved an amendment to provide that it shall be lawful for His Majesty from time to time by Order in Council to transfer to the Board all or any of the powers and duties of the Secretary for Scotland under enactments relating to lunacy and mental deficiency.—Mr. MUNRO said, while he was anxious that the transfer of powers should be as comprehensive as possible, there would be great difficulty in the transfer of the powers of the Board of Control in accordance with the amendment. The Board of Control was a Board of unique distinction in Scotland and of European reputation, and to place the Board under the control of another Board in Edinburgh would be a rather difficult and ungracious proceeding. On the other hand, he quite agreed that there were certain powers which might well be transferred to the new Board, and he was prepared to accept the amendment with the omission of the first two words "all or."—The amendment with this alteration was agreed to.

Mr. MUNRO, with reference to Clause 5 which sets up consultative councils, agreed that due regard would be had in the composition of these councils to any special interests, including those of local authorities and of labour, which might be involved.

The remaining clauses of the Bill were agreed to, and the Bill as amended was ordered to be reported to the House.

HOUSE OF COMMONS.

WEDNESDAY, APRIL 2ND.

Medical Treatment of Demobilised Men.

Mr. DEVLIN asked the Pensions Minister the number of demobilised men in Belfast who had claimed impairment of their health due to or aggravated by war service, and the number whose claims had been admitted; whether he was aware that no arrangements had been made by the Ministry for general practitioners' treatment of these men, who, unlike the similar class in Great Britain, were compelled to pay for treatment themselves, or to seek treatment from the Poor-law dispensary medical officer, or in the Belfast Workhouse Hospital; whether he would state the number of impaired men at present receiving treatment in the Belfast Workhouse Hospital; whether he was aware of the dissatisfaction existing amongst this class of demobilised men in Ireland because of the absence of facilities for home treatment; and whether he was now in a position to state when adequate arrangements for such treatment would be made for the whole country?—Sir L. WORTHINGTON-EVANS replied: I am endeavouring to obtain the information asked for in the first and third parts of the question. As the honourable Member is aware the question of granting general practitioners' treatment to demobilised men in Ireland who have suffered impairment in the war has engaged my attention and the matter is now before the Treasury. I hope a decision will soon be reached.

Mr. DEVLIN: Will the right honourable gentleman kindly explain how it is that arrangements have been made for treating English soldiers, and that you are only now considering how Irish soldiers should be treated; and what is the reason of the Treasury putting obstacles in the way in Ireland when they have allowed this matter to be settled in England?—Sir L. WORTHINGTON-EVANS: As my honourable friend is fully aware, facilities for treatment in Ireland and in England have been different for some time, and I am now trying to extend to Ireland the facilities that exist in England.

Closing the Smaller Military Hospitals.

Lieutenant-Colonel Sir JOHN HOPE asked the Secretary for War whether the New Zealand Force had offered to hand over to the War Office three hospitals, each having accommodation for 2000 beds; and whether he would consider the desirability of closing down small military hospitals, both in the interests of economy and in order that better effect might be given to the scheme of vocational training for civil life among walking patients in hospitals by their concentration in large hospitals.—Mr. CHURCHILL: No, sir. No such offer has been received by the War Office from the Dominion authorities. These authorities have, however, been requested to report the dates on which they will be vacating their hospitals in order that the War Office may have an opportunity

of stating whether it is desired to take them over or not. The policy now being carried out is to close down the smaller hospitals and concentrate on the larger hospitals. This is being done both in the interests of vocational training and of economy.

Butter for Invalids.

Mr. RUPERT GWYNNE asked the Food Controller whether M. F. Butter 7 is still in force; whether the effect of this memorandum was to prohibit the supply of more than 6 oz. of butter to an invalid, although such invalid was suffering from tuberculosis, and the medical attendant had certified that a larger amount is essential for treatment; and, if this was the case, would he consider revising the order.—Mr. PRATT (Lord of the Treasury) replied: The answer to the first two parts of the question is in the affirmative. As regards the third part, the Ministry are definitely advised that the allowance of butter stated, when supplemented by cooking fats, which can now be obtained in any quantities, is sufficient to meet the medical requirements of such patients. The Food Controller appreciates, however, that in the case of invalids rations should, so far as possible, err on the side of liberality, and notwithstanding the continuing shortage of butter he is considering the revision of the present arrangement.

Government Control of Hospitals.

Major LANE-FOX asked the Prime Minister whether there was any truth in the report that it was the intention of the Government by successive steps to take over all hospitals during the next 40 years—beginning at once with St. George's Hospital—and whether, in view of the effect that such a report might have on the flow of private subscriptions to such hospitals, he could at once substantiate or deny it?—Major ASTOR (Parliamentary Secretary to the Local Government Board) replied: There is no foundation for the suggestions contained in the question.

THURSDAY, APRIL 3RD.

Pressure on Civilian Hospitals.

Mr. CAIRNS asked the Secretary for War if he was aware that an order had been issued to close the 1st Northern General Hospital, Territorial Force, and the Gosforth War Hospital; if so, would he see that the orders were withdrawn, as it would greatly increase the burden of the already over-worked civil hospitals; was there any reason why the Gosforth War Hospital, for the demobilisation of which there had been no local demand, should not be retained for six months as a stand-by hospital for soldier and pensioner patients; and was he aware that at the civil hospitals there were long waiting lists, as some hundreds were waiting owing to soldiers and sailors being treated first during the war.—Mr. CHURCHILL replied: The 1st Northern Hospital, Newcastle-upon-Tyne, situated in the Armstrong College of the Durham University, is to be closed shortly at the request of the Board of Agriculture and the Board of Education. The exact date of closure is dependent on the extension of the Royal Victoria Infirmary, Newcastle, being ready for occupation; the patients will be moved to this latter hospital. By the Gosforth War Hospital I presume the honourable Member refers to the Northumberland War Hospital. This hospital is to be closed by the beginning of May at the request of the Lunacy Board of Control. Arrangements are also being made to absorb the patients from this hospital in other military hospitals. The evacuation of beds occupied by military patients in civil hospitals is progressing as speedily as circumstances permit.

Egyptian Fellaheen Medical Service.

Colonel WEDGWOOD asked the Secretary for War whether complaints were made as to the inadequacy of the medical service for the Egyptian fellaheen who enlisted in the Labour Corps, Camel Transport, or Donkey Transport; and how many of these fellaheen died on service?—Mr. CHURCHILL replied: No information has been received at the War Office as to the medical services for the Egyptian fellaheen having been inadequate, but if my honourable and gallant friend has any specific information on this point I will have the matter inquired into.

Consumptives in the Army.

Sir WATSON CHEYNE asked the Parliamentary Secretary to the Local Government Board whether he would state how many soldiers had been discharged from the Army on account of pulmonary tuberculosis since August 4th, 1914; how many soldiers who had been discharged from the Army were at present receiving treatment in sanatoriums; and how many were on the waiting list for such treatment.—Major ASTOR replied: The number of men discharged from the Service since August 4th, 1914, on account of pulmonary tuberculosis cannot be precisely determined from the records of the Pensions Ministry, but it is estimated at 25,000. I am unable to say how many of these were considered suitable for institutional treatment or did actually undergo such treatment. The number undergoing residential treatment in sanatoriums and hospitals on March 1st, 1919, was approximately 3150 and the number on the waiting list was 470.

MONDAY, APRIL 7TH.

Medical Inspection of School Children in Ireland.

Captain CHARLES CRAIG asked the Chief Secretary to the Lord Lieutenant of Ireland if he would state the amount of money expended on the medical and dental inspection and treatment of Irish national school children for each of the years for which a vote for that purpose had been given, and the amount of the vote which had been returned each year to the Exchequer because local equivalents could not be raised in Ireland.—Mr. MACPHERSON replied: The following statement shows the amount provided in the Vote for Public Education, Ireland, for the medical inspection of national school children and services auxiliary thereto and the amount actually paid by the Commissioners of National Education as grants in respect of that service during the financial year 1912-13 (in which money for the purpose was first voted by Parliament) and each subsequent year:—

Year ended	Provision in Vote for Public Education, Ireland.	Expenditure.
31/3/1913	£7500	£263 2*s.* 6*d.*
31/3/1914	5000	498 7*s.* 3*d.*
31/3/1915	3000	801 2*s.* 8*d.*
31/3/1916	2000	548 15*s.* 4*d.*
31/3/1917	1500	612 8*s.* 7*d.*
31/3/1918	1000	647 4*s.* 10*d.*
31/3/1919	1500	498 7*s.* 10*d.*

TUESDAY, APRIL 8TH.

Demobilisation of Medical Officers.

Lieutenant-Colonel WEIGALL asked the Secretary of State for War if he would state what progress had been made in the demobilisation of doctors since March 1st last.—Mr. CHURCHILL replied: The total numbers of medical officers released during the months of January, February, and March were 403, 1071, and 1787 respectively.

Army Huts for Tuberculous Patients.

Replying to a question by Mr. GEORGE THORNE, Mr. CHURCHILL (Secretary of State for War) said: I am informed that no applications for Army huts to be used to provide institutional treatment for tuberculous patients have been received by the War Office. The Army authorities do not refuse to liberate disused Army huts. All huts that are no longer required are reported to the Disposal Board, Ministry of Munitions, and disposed of under arrangements made by them. Such huts are prominently advertised in the daily papers. A considerable number of hutments are still required by the Army for demobilisation purposes and to accommodate units and equipment returning from abroad, but a steadily increasing quantity of huts is being released.

WEDNESDAY, APRIL 9TH.

Ministry of Health Bill.

The Ministry of Health Bill as amended in the Standing Committee was considered on report by the House of Commons on Wednesday, April 9th. On Clause 2 Mr. STEWART moved an amendment bringing venereal diseases and the confidential notification of them within the scope of the Ministry of Health.—Mr. CAIRNS seconded.—Major ASTOR (Parliamentary Secretary to the Local Government Board) said that if this amendment were made it would confer no new powers or obligation on the Department. The Minister was going ahead as fast as possible with the provision of treatment centres, and if he desired new powers he would have no hesitation in asking for them.—Sir W. WHITLA said that notification would drive every affected person to a quack.—The amendment was withdrawn.

An amendment moved by Dr. ADDISON, including the initiation and direction of research among the powers of the Ministry of Health, was agreed to.

Sir S. HOARE moved an amendment that no person should be compelled to receive treatment who made a declaration that on conscientious grounds he objected to medical treatment, and who, after making the declaration, did not endanger the health of any other person.—Dr. ADDISON said medical treatment would not be inflicted on people who objected to it. The amendment was unworkable.—The amendment was withdrawn.

On the motion of Dr. ADDISON an amendment to Clause 3 was agreed to, making workable the decision arrived at in Committee to transfer the powers of the Board of Education in respect of inspection and treatment of children to the Ministry of Health. The proviso reads as follows:—

Provided that, for the purpose of facilitating the effective exercise and performance of these powers and duties, the Minister may make arrangements with the Board of Education respecting the submission and approval of schemes of local education authorities and the payment of grants to local education authorities, so far as such schemes and payment relate to or are in respect of medical inspection and treatment; and the powers and duties of the Minister may under any such arrangements be exercised and performed by the Board on his behalf and with his authority under such conditions as he may think fit.

The Report stage was completed and the Bill was read a third time.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

HEANEY, F. J. STRONG, M.D., F.R.C.S.I., has been appointed Honorary Surgeon to the Liverpool Hospital for Cancer and Skin Diseases.

POTTS, G., F.R.C.S. Edin., Honorary Surgeon to the Kent County Ophthalmic Hospital, vice C. Killick, F.R.C.S.

YOUNG, F. W. BAKER, M.B., Ch.B. Vict., Honorary Surgeon to the Liverpool Hospital for Cancer and Skin Diseases.

Certifying Surgeons under the Factory and Workshop Acts: LANGLEY, J. I. (Shefford); TIMOTHY, J. H., M.R.C.S., L.R.C.P. Lond. (Brynamman); CLARKE, P., M.B. Q.U. Belfast (Gortin); STACEY, J. E., M.B., Ch.B. Shef. (Sheffield, East).

Vacancies.

For further information refer to the advertisement columns.

Aberdeen City, Mother and Child Welfare.—M.O. £500.

Aberdeen Royal Infirmary.—Asst. Phys. and Two Asst. Surg. Also Three Res. M.O.

Bedford County Hospital.—H.P. £150.

Birmingham and Midland Eye Hospital.—H.S. £200.

Birmingham, Queen's Hospital.—Third S. £50.

Bombay, Municipal Corporation of the City of.—Exec. Health Officer. Rs. 1500 to Rs. 2000 monthly.

Bradford City Health Department.—Asst. M.O. £400.

Bradford Royal Infirmary.—H.S. £200. Also H.P. £200.

Bristol General Hospital.—Dent. H.S. £250. Also Med. and Surg. Registrars.

Cardiff City.—Female Asst. M.O. £100.

Central London Ophthalmic Hospital, Judd-street, St. Pancras.—H.S. £50.

Chelsea Hospital for Women, Arthur-street, Chelsea, S.W.—Surg.

Derbyshire Hospital for Sick Children.—Female Res. M.O. £150.

Dorset County Asylum, near Dorchester.—Second Asst. M.O. £300.

East Riding Lunatic Asylum, Beverley.—Med. Supt. £900.

Edinburgh University.—Christison Chair of Therapeutics. £1000.

Falkland Islands.—Colonial S. £400. Also Colonial Dent. S. £400.

Fiji Medical Appointments.—Five M.O. £300.

Glamorgan County Asylum, Bridgend.—Fourth Asst. M.O. £100.

Great Northern Central Hospital, Holloway, London, N.—H.S. £150.

Guildford, Royal Surrey County Hospital.—H.S.

Hammersmith Parish.—Dist. M.O. and Pub. Vac. £150.

High Carley Sanatorium, nr. Ulverston.—Asst. Tuberc. M.O. £350.

Hospital for Consumption and Diseases of the Chest, Brompton.—H.P. and Asst. Tuberc. O. 30 gs.

Jarrow Borough.—M.O.H. £750.

Keighley Borough Education Committee.—Female Asst. M.O. £350.

Lanark County, Lower Ward.—Asst. M.O.H. and Tuberc. O. £400.

Lancashire County Council.—Two Asst. Disp. Tuberc. Officers. £550.

Leeds Education Committee.—Asst. Sch. M.O. £400.

Leeds General Infirmary.—Res. Cas. O. £125.

Lochgoilhead and Kilmorich Parish.—M.O. and Vac. £300.

Manchester Royal Infirmary, Central Branch, Ruby-street.—Res. Surg. O. £200.

Manchester and Salford Hospital for Skin Diseases.—H.S.

Manchester Union, Booth Hall Infirmary for Children, Charlestown-road, Blackley, near Manchester.—Asst. Res. M.O. £250.

Margate, Royal Sea Bathing Hospital for Surgical Tuberculosis.—Res. Surg. £300.

Middlesbrough County Borough.—Female M.O. for Maternity and Child Welfare. £400.

Middlesex Education Committee.—Temp. Asst. School M.O. £400.

Mile End Old Town Infirmary.—Med. Supt. £400.

Newport, Mon., Royal Gwent Hospital.—Two R.M.O. £230 and £225.

Northampton General Hospital.—H.P. £200.

Nottingham General Hospital.—Cas. H.S. £250.

Nottingham and Midland Eye Infirmary.—Female H.S. £200 to £250.

Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—Hon. Surg. to Ear, Nose, and Throat Dept.

Rochdale Infirmary and Dispensary.—Jun. H.S. £100.

Royal College of Surgeons of England.—Election of Examiners and of Member to the Court of Examiners.

Royal Free Hospital, Gray's Inn-road, W.C.—Curator of Museum. £150.

Saint Lucia.—M.O. £350.

St. Mark's Hospital for Cancer, Fistula, and other Diseases of the Rectum, City-road, E.C.—Hon. P.

St. Peter's Hospital, Henrietta-street, Covent Garden, W.C.—Asst. S.

Salford, Ladywell Sanatorium for Infectious Diseases and Tuberculosis.—Asst. R.M.O. £200-£300.

Seychelles Government.—Asst. M.O. and Visiting Magistrate. £200.

Sheffield Royal Infirmary.—Res. S.O. £200.

Sheffield University.—Demonstrator for Department of Pathology and Bacteriology. £300. Demonstrator in Anatomy. £350.

Southampton, Free Eye Hospital.—H.S. £150.

South London Hospital for Women, South Side, Clapham Common, S.W.—Female H.P. £100.

Swansea County Borough.—Asst. M.O. £500 and £400.

University College Hospital.—Clinical Pathologist. £500.

University of London.—University Chair of Anatomy (Royal Free Hospital) School of Medicine for Women. £600. Also University Chair of Anatomy at Guy's Hospital Medical School. £600.

Walsall General Hospital.—Female H.S. and Anæsth. £175.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Creech St. Michael, in the county of Somerset.

Births, Marriages, and Deaths.

BIRTHS.

BRENNAN.—On March 22nd, 1919, at Dalbrook Park, Dundrum, Co. Dublin, the wife of Captain J. P. Brennan, R.A.M.C., of a son.

COLLINS.—On April 1st, at Ewell War Hospital, Epsom, the wife of Lieutenant-Colonel M. A. Collins, R.A.M.C., of a son.

EAST.—On April 5th, at 28, Mattock-lane, Ealing, W., the wife of A. Gerard East, M.B., B.Ch. (late R.A.M.C.), of a daughter.

MARRIAGES.

AYLWARD—GOODWIN.—On April 2nd, at St. Ethelbert, Herringswell, Captain Roy Douglas Aylward, R.A.M.C., to Grace Mary Otway, daughter of Mr. and Mrs. J. D. Goodwin, Herringswell, Suffolk.

FAWCETT—BURRA.—On April 3rd, at St. Mary's, Norton, Kent, Major Hugh Herbert James Fawcett, D.S.O., R.A.M.C., to Margaret Félicie Burra, youngest daughter of the late James Salkeld Burra, of Bockhanger, Kennington, Kent.

DEATHS.

DRAKE.—On April 1st, at "Chisledon," Reigate, Charles Henry Drake, M.R.C.S., aged 82.

GRIFFIN.—On April 1st, at Mundesley, Norfolk, John Purser Griffin, M.R.C.S., L.R.C.P., late of Baldock, Herts.

LEIGH.—On March 31st, at Brighton, Thomas Leigh, M.R.C.S., L.R.C.P., in his 78th year.

KELLGREN.—On April 3rd, at Sloane-street, Harry J. H. Kellgren, M.A., L.M.S.S.A., elder son of the late Director Henrik Kellgren, of Sanna, Sweden.

MACKENZIE DAVIDSON.—On April 2nd, at Park-crescent, W., from heart failure, Sir James Mackenzie Davidson.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.1.

Tuesday, April 15th.

SPECIAL GENERAL MEETING OF FELLOWS, at 5 P.M.

(1) To consider, and, if approved, to confirm, proposal by the Council to provide in the By-laws that the Council may, upon written application, reinstate without admission fee Fellows who have resigned during the War.

(2) To consider, and, if approved, to confirm, proposal by the Council to constitute a new Section—viz., a Section to deal with questions of Medicine and Surgery in connexion with the Naval, Military, and Air Forces.

GENERAL MEETING OF FELLOWS: at 5 P.M.

Ballot for Election to the Fellowship. (Names already circulated.)

MEETINGS OF SECTIONS.

Tuesday, April 15th.

THERAPEUTICS AND PHARMACOLOGY (Hon. Secretaries—W. Langdon Brown, Philip Hamill): at 4.30 P.M.

Annual Meeting.—Election of Officers and Council for 1919-1920.

Paper:

Dr. Bossan (Paris): A New Treatment for Pulmonary Tuberculosis.

PATHOLOGY (Hon. Secretaries—Gordon W. Goodhart, J. A. Murray): at 8.30 P.M.

Annual Meeting.—Election of Officers and Council for 1919-1920.

Papers:

Dr. E. H. Kettle: On Polymorphism of the Malignant Epithelial Cell.

Dr. J. Burton Cleland: The Conveyance of the Virus of a Human Acute Infective Polio-encephalo-myelitis occurring in Australia to Monkeys, Sheep, a Calf and a Foal. (Communicated by Professor C. J. Martin, F.R.S.)

Dr. W. E. Bullock and Dr. W. Cramer: Further Observations on the Mechanism of Bacterial Infections.

Dr. J. McIntosh: Experimental Gas Gangrene: Serum Therapy.

Mr. S. G. Shattock: Appendicular Contents and Concretion.

Demonstrations by Dr. J. A. Murray.

Wednesday, April 16th.

HISTORY OF MEDICINE (Hon. Secretaries—Charles Singer, Arnold Chaplin): at 5 P.M.

Paper:

Dr. Leonard Mark: The Medical Aspects of Montaigne.

The Royal Society of Medicine keeps open house for medical officers of all the Allied Forces, and invites them to make free use of its library and rooms. The Emergency Post Graduate Scheme, under the charge of the "Fellowship of Medicine," is also open to all medical officers. Particulars of this will be supplied by the Secretary, Fellowship of Medicine, 1, Wimpole-street, London, W.1.

MEDICAL SOCIETY OF LONDON, 11, Chandos-st., Cavendish-sq., W.

MONDAY, April 14th.—8.30 P.M., Clinical Evening.

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.

MONDAY, April 14th.—4.30 P.M., Cantor Lecture:—Prof. H. E. Armstrong: Problems of Food and their Connexion with our Economic Policy. (Lecture III.)

LONDON DERMATOLOGICAL SOCIETY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, April 15th.—4.15 P.M., Demonstration of Pathological Specimens. Cases sent for Consultation. Exhibition of Clinical Cases by Dr. M. Dockrell, Dr. J. L. Bunch, Dr. W. Griffith, Dr. W. K. Sibley, Dr. N. Walmisley, Dr. E. J. D. Mitchell, and Dr. S. Kapoor.

ROYAL METEOROLOGICAL SOCIETY, 70, Victoria-street, S.W.

WEDNESDAY, April 16th.—5 P.M., Papers:—Mr. H. A. Barnes: Rainfall in England: the True Long average as deduced from Symmetry.—Mr. C. E. B. Brooks: The Secular Variation of Rainfall.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

LONDON HOSPITAL MEDICAL COLLEGE.

A Special Course of Instruction in the Surgical Dyspepsias will be given at the Hospital by Mr. A. J. Walton. Lectures, given in the Clinical Theatre:—

MONDAY, April 14th.—1 P.M., Lecture XII.:—Congenital and Acquired Pyloric Stenosis.

BOOKS, ETC., RECEIVED.

CHURCHILL, J. AND A., London.

The After Treatment of Wounds and Injuries. By R. C. Elmslie, Brevet Major, R.A.M.C.(T.F.) 15*s.*

Introduction to the Physics and Chemistry of Colloids. By E. Hatschek. 3rd ed. 4*s.* 6*d.*

Diseases of the Skin. By J. H. Sequeira, M.D. 3rd ed. 36*s.*

Practical Physiological Chemistry. By P. B. Hawk, M.S. 6th ed., revised and enlarged. 21*s.*

The Normal and Pathological History of the Mouth. By A. Hopewell Smith, L.D.S. Eng. 2 vols. £2 2*s.*

FROWDE, H., and HODDER AND STOUGHTON, London.

Nerve Injuries and their Treatment. By Sir J. Purves Stewart, M.D., and A. Evans, M.S. 2nd ed. 12*s.* 6*d.*

Practical Obstetrics. By E. Hastings Tweedy, F.R.C.P.I., and G. T. Wrench, M.D. 4th ed. 21*s.*

Anatomy of the Peripheral Nerves. By A. Melville Paterson, M.D. 12*s.* 6*d.*

Forms of Alcoholism and their Treatment. By Hugh Wingfield, M.D.

LEWIS, H. K., AND CO., LTD., London.

The War Work of the Y.M.C.A. in Egypt. By J. W. Barrett, Temp. Lieut.-Col., R.A.M.C. 10*s.* 6*d.*

Chronic Traumatic Osteomyelitis. By J. Rentrew White, M.B. N.Z. 12*s.* 6*d.*

Catalogue of Lewis's Medical and Scientific Circulating Library. Revised to end of 1917. 12*s.* 6*d.*

Chest Radiography at a Casualty Clearing Station, with Atlas. By R. Lindsay Rea, B.Sc., M.B. 15*s.*

Communications, Letters, &c., to the Editor have been received from—

A.—Armenian Red Cross and Refugee Fund, Lond.; Army Medical Service, Director-General of; Dr. H. K. Abbott, Fareham; Dr. G. R. Anderson, Southport; Col. J. G. Adami, A.D.M.S.

B.—Messrs. Butterworth and Co. (India), Calcutta; Dr. H. E. G. Boyle, Lond.; Dr. J. Blomfield, O.B.E., Lond.; Board of Trade, Lond., Asst. Sec. of; Capt. S. C. Billington, R.A.M.C.; Lieut.-Col. F. S. Brereton, R.A.M.C.; British Science Guild, Lond.; Messrs. A. and C. Black, Lond.; Prof. W. M. Bayliss, Lond.; Dr. A. G. Bagshawe, C.M.G., Lond.

C.—Crookes' Collosols, Ltd., Lond.; Capt. J. C. Clayton, R.A.M.C.; Conjoint Board of Scientific Societies, Lond., Sec. of; Mr. H. Curtis, Lond.

D.—Dr. S. E. Dore, Lond.; Dr. F. H. Diggle, Edinburgh; Mr. E. Donald, Lond.; Col. L. S. Dudgeon, C.M.G., A.M.S.; Dr. H. Drinkwater, Wrexham; Decimal Association, Lond.

F.—Factories, Chief Inspector of, Lond.; Mr. E. R. Flint, Leeds; Dr. R. H. Fox, Lond.; Fiat Co., Turin; Food (War) Committee, Royal Society, Lond.; Mr. A. Fleming, Lond.; Capt. J. G. Forbes, R.A.M.C.

G.—Dr. M. S. Gutteling, Utrecht; Mr. G. T. Gurr, Lond.; Dr. A. K. Gordon, Lond.; Dr. S. R. Gloyne, Lond.

H.—Dr. I. Harris, Liverpool; Capt. P. D. Hunter, R.A.M.C.; Major R. A. Hill, R.A.M.C.; Dr. C. W. Hutt, Brighton; Dr. C. F. Hadfield, Lond.; Dr. L. Hill, Lond.; Capt. C. T. W. Hirsch, R.A.M.C.

J.—Lieut.-Col. S. P. James, I.M.S. (retd.), Lond.; Prof. F. Wood Jones, Lond.

K.—Mr. H. S. F. King, Lond.

L.—Miss E. Lowry, M.B., Lond.; Lieut. J. Leach; Dr. T. Lumsden, Lond.; Dr. P. Lassablière, Paris; Local Government Board, Lond., Sec. of; Dr. T. Lewis, Lond.; London Homœopathic Hospital, Sec. of.

M.—Mr. T. H. Morse, Deal; Mr. J. S. Milne, Swalwell-on-Tyne; Medical Research Committee, Lond.; Dr. J. L. Martin, Chelmsford; Ministry of Pensions, Lond., Superintendent of Publicity of; Lieut.-Col. B. E. Myers, N.Z.E.F.; Mr. C. MacMahon, Lond.; Bt. Lieut.-Col. F. W. Mott, R.A.M.C.(T.)

N.—Major C. Noon, R.A.M.C.; National Institute for the Blind, Lond.

P.—Peace Nursing and Midwifery Conference and Exhibition, Lond., Sec. of; Major M. G. Pearson, S.A.M.C.; Mr. L. Paton, Lond.; Dr. S. V. Pearson, Mundesley; Mr. W. H. Plows, Lond.

R.—Mrs. A. E. Rendle, Rotherfield; Rontgen Society, Lond., Hon. Sec. of; Royal Mail Steam Packet Co., Lond.; Dr. J. D. Rolleston, Lond.

S.—Dr. E. B. Sherlock, Lond.; Dr. H. Sutherland, Lond.; Prof. W. Stirling, Manchester; Capt. J. K. Syms, R.A.M.C., Lond.; H.M. Stationery Office, Lond.; Mr. E. E. Smith, Mutley; Prof. E. H. Starling, C.M.G., Lond.

T.—Dr. F. S. Tinker, Sutton; Col. G. R. Turner, C.B., Plymouth; Dr. W. W. C. Topley, Lond.; Messrs. C. Thomas and Bros., Bristol.

W.—Mr. A. S. Wilson, Aberdeen; Dr. J. Watson, Jersey; Mr. C. Westman, Lond.; Dr. F. P. Weber, Lond.

Y.—Prof. W. Yorke, Liverpool.

Communications relating to editorial business should be addressed exclusively to the Editor of THE LANCET, 423, Strand, London, W.C. 2.

Notes, Short Comments, and Answers to Correspondents.

INFANT MORTALITY AND HOUSING.

A PAPER of exceptional interest on this subject was read by Dr. Leonard Hill on April 9th before the Royal Society of Arts. After remarking on the high death-rate normally prevalent in industrial, as compared with rural, districts, Dr. Hill went on to say that the high mortality was due to excess of respiratory and digestive ailments, particularly of the latter. Proper feeding was of paramount importance. There were two factors in the matter of proper feeding: (1) The right choice of food; (2) the need for food set by the expenditure of energy in keeping the body warm. He wished particularly to emphasise the second factor. The rate of cooling of the body is, he maintained, closely connected with both causes of high infant mortality, for the cooling and evaporative power of the air acts not only on the skin, but also upon the respiratory membrane. Cool, moving air is the natural stimulus to activity and appetite, to deep breathing, active circulation, thorough oxygenation, and good digestion. Hence the perfect fitness of the wild animal. He pointed out that cool air has a low vapour tension compared with warm humid air, and that, when breathed, it promotes evaporation from and flow of blood and lymph through the respiratory membrane, the natural defences against infection; that the eyes water and the nose runs in a frosty wind; and that exercise increases the breathing volume some five times, and the flow of blood and lymph through the membrane proportionately. Physiological research had proved conclusively that it is not the chemical impurity, but the physical conditions of close air which make for discomfort and impoverish health: not excess of carbonic acid, nor lack of oxygen, nor the presence of organic impurities which affect us in a crowded room, but the heat and moisture of the air. The victims of the Black Hole of Calcutta had died not of suffocation, but of heat stroke. A very wide series of observations had shown him that the cooling and evaporative powers in rooms commonly approximate to those in tropical, humid climates so admittedly enervating to man. With a heap of clothes on them the babies' bodies were surrounded with air at 30·5°–35·5° C., a tropical, still, humid atmosphere. In the warm humid air of a crowded tenement the one cooling surface left free to the baby—the head, and this was bonneted—was exposed to the same tropical atmosphere. Plato had condemned swaddling, which, however, still persisted. Darwin described the naked mother standing in the cold sleet in Terra-del-Fuego with the naked babe in her arms. There we had the picture of an excessive exposure, in spite of which, and the extreme difficulties of feeding, the people survived. How little exposure kills the infants was shown by the fact that the Terra-del-Fuegians practise infanticide to keep the population down to the level of the food-supply. Europeans, in place of quickly strangling their children, exposed them to massive infection and reduced their nutrition and resistance to disease.

Opposing the theory that the high infant mortality of towns is due to atmospheric impurity, Dr. Hill pointed out that in West Ireland the hovels are built on the peat bog, on a seaboard open to the Atlantic with a peat fire ceaselessly burning on the hearthstone, and the smoke ascending to a hole in the roof. The smoke pollution of the air which is breathed by the children, who huddle round and sleep close to these peat fires, could not be much less than that endured by the inhabitants of industrial towns, and yet it was among these people that infant mortality reached so low a rate. Their infants were saved by breast-feeding and exposure to open air. The rise of the death-rate from respiratory disease with the onset of cold weather Dr. Hill attributed to the coincident increase in the number of stuffy and overheated rooms.

In discussing the relation of summer diarrhœa to infant mortality Dr. Hill said that the activity of digestion, absorption, and clean healthy state of the bowel depended on the heat loss and the food consumed being in proper relation. The heat-stifled baby was overfed. He believed that the depression of metabolism was also a potent cause of metabolic deficiency diseases, such as scurvy and rickets.

Coupled no less with children's metabolism and the healthy state of the alimentary canal was the decay of teeth, from which 80 to 90 per cent. of London County Council school children were said to suffer. Just as in the case of the nose, exposure to cool, open air, and exercise brought more arterial blood to the mouth and favoured the outflow of cleansing and immunising secretions. Tooth-brush drill had done nothing to lessen the decay of children's teeth.

Dr. Hill then considered the composition of human milk and argued that this indicated by its fuel value that the

infant should run its metabolism at a high level, that it should not be kept too warm and too quiet all the time, but played with and exercised naked, in cool surroundings, for some part of the day. Only by forcing up the metabolism by exercise and cool surroundings would the infant secure sufficient building materials for vigorous growth. The paper concluded with an eloquent appeal for better housing conditions.

A PRACTICAL WAR MEMORIAL.

IT has been suggested that every large centre of population should possess a social club where under the auspices of the "Red Triangle" congenial facilities for social intercourse would be provided for men, women, and children. As a commencement in this direction a social centre, with facilities for sports, amusements, and education, is being erected at Plaistow, and will be known as the Plaistow Red Triangle War Memorial. The cost of erecting the building, which will be some £50,000, is being defrayed by some of the leading shipping firms of the Port of London, and it is hoped that the club will be ready for occupation by the end of the year.

LEAD LINE ON TAILORS' GUMS: A DANGEROUS PRACTICE.

To the Editor of THE LANCET.

SIR,—A Hebrew tailor, aged 31, came to consult me about his child's health, and as he was talking to me I noticed a blue line on the gums. As there was the least trace of pyorrhœa, I sent him to his dentist, who corroborated my observation with regard to the lead line, and was also able to elicit the fact that the man was in the habit of using his mouth as a receptacle for pins during the work of fitting.

I am, Sir, yours faithfully,

Swansea, April 6th, 1919. G. ARBOUR STEPHENS.

THE CHILD AS AN INDUCEMENT.

LAST week in this column we gave instances of the child as an impediment to families in search of proper urban accommodation. The tables have been turned in Detroit, where, according to the *Times* of April 7th, the State organisation of the Methodist Mission Centenary has voted £120,000 for the reconstruction, as an experiment, of a block of flats in the heart of the city from which childless couples will be excluded. A feature of the building will be a completely equipped playground on the roof. Obviously such facilities would be thrown away on the childless married.

HEALTH AND LIFE IN THE TROPICS.

THE value of a sound knowledge of first aid in tropical medicine on the part of their representatives in Africa and other hot countries is being recognised by the heads of many business firms; as the outcome of this interest Sir James Cantlie, Principal of the College of Ambulance, has inaugurated a series of lectures on Tropical Ailments and Their Prevention. The lectures will be given by medical men who have made a special study of tropical diseases. The first lecture was delivered on March 31st by Sir James Cantlie on Personal Hygiene. On April 2nd Professor W. J. R. Simpson spoke on Tropical Sanitation. He described the climate of the belt lying between the tropics of Cancer and Capricorn; the hottest places were situated in the regions of the tropics, and the variations of climate depended on altitude as well as latitude. Houses intended for Europeans should not be built near native dwellings, because in places where mosquitoes abounded the infection of malaria and yellow fever was carried from the natives to the Europeans. The site should be dry and away from marsh land, as the latter, though appearing suitable in summer, might be inundated during the rainy season. Buildings should be erected on a slope, if possible; a two-storeyed house was more healthy than a bungalow, but either should be built on a raised platform 6 feet above the ground. If built on pillars of a lower height the smaller space below the house was apt to become a harbour for rubbish. Solid arches might be used as an alternative method of construction. In both cases the buildings should be approached by a few steps. Ceilings should be high or the house would become hot and disagreeable. Between the ceiling and the roof there should be a good air space with ventilating screens of mosquito netting to prevent the entrance of bats. Verandahs 10 or 12 feet wide should be provided in order to keep the walls cool and to allow the occupants to enjoy the cool air in the later part of the day. Sanitary offices should be constructed in towers at the back of the house. Houses could also be kept dry by surrounding them with a sloping platform with a drain close to the walls of the house or verandah. This platform should terminate in a stretch of Indian or Bramah grass, which grows very short and allows the water, which might otherwise lie in pools, to evaporate quickly. Between the grass and the drain there should be a belt of sharp gravel to prevent the approach of snakes. There should be no trees near the house, and this applied especially to banana or bamboo plants, as they held moisture and harboured the larvæ of mosquitoes. Houses built round a courtyard possessed certain advantages: the rooms could be well ventilated and protection by mosquito screens was easier. The servants' quarters should be away from the house; the kitchens should be well detached and approached by a covered passage; the servants' quarters should be inspected periodically, as rubbish was likely to collect and become a breeding-place for mosquitoes. Cleanliness in the kitchen should be insisted upon. In malarious districts some part of the verandah should be mosquito-proof, netting at least 20 strands to the inch being necessary, and ventilation effected by electric fans. In some cases the whole house would have to be mosquito-proof. Milk should always be boiled as the natives made a practice of adulterating it with water which was generally contaminated. Water should be boiled and filtered, and care taken to see that the filter was acting properly; he had frequently found defective filters being relied upon. With the exception of the tank storage of rain water, no water-supply in the tropics was safe. Servants would often dip water out of the filter before it had passed through the filtering candles. Salads were dangerous on account of the possibility of their contamination by the fæcal matter which was used on the fields. Fruits which grew above the ground were safe, but anything that grew close to the ground or under it should be avoided or special care taken in cooking it. The lecturer said that he always advised young men going to the tropics to take 5 gr. of quinine on arrival and, in malarious districts, to take 5 gr. immediately after the morning meal. It was his practice to have 5-gr. tablets on the breakfast table, so that they might not be forgotten. It was always necessary to sleep under a mosquito net.

DRY SWEEPING IN RAILWAY CARRIAGES.

To the Editor of THE LANCET.

SIR,—May I through the influence of this journal appeal for the abolition of the unwholesome practice of dry sweeping railway carriages and non-open-air platforms and courtyards. In all such places, especially when dingy and dimly lighted, individuals without a social conscience expectorate, without, as far as I have seen, any notice of the offence being taken by the railway servants. Such a person, if remonstrated with, will scrape the expectoration about in the dust with his boot, thus anticipating with æsthetic promptness the similar "cleaning" process deliberately provided by the enlightened railway company. From the dust of such places, besides insidious tuberculosis infection, there may be, apparently, sundry other more rapid, if less deadly, infections. I, for instance, am just recovering from a feverish head- and chest-cold caused, I feel sure, by travelling in a railway carriage immediately after the train had been dry swept.

In order to avoid indicating which railway I regard as the offender in this case I sign myself, Sir,

Yours faithfully,

London, March 31st, 1919. VIATOR.

COLONIAL HEALTH REPORTS.

Bahamas.—In the report by Mr. H. E. W. Grant, Colonial Secretary of the Bahamas, for the year ended March 31st, 1918, the estimated population is put at 60,932. The birth-rate for the year 1917 was 38·1 and the death-rate 20 per 1000. 414 marriages were registered—92 less than in 1916. The public health was on the whole good. No epidemic of infectious or contagious disease occurred, and the number of reportable diseases was less than usual. A Commission was appointed in January, 1918, to inquire into and report on the prevalence of venereal diseases and make recommendations for dealing with the problem. During the year there were 821 persons treated in the hospital; 287 were discharged recovered, 229 relieved, and 148 died.

Swaziland.—The last Census showed that the total population was 99,959, comprising 1083 Europeans, 143 coloured, and 98,733 natives. European births for the year 1917–18 numbered 49, or approximately 38 per 1000, and the deaths 18, or approximately 15 per 1000. The births and deaths of natives are not registered. There was little serious sickness during the year and a marked absence of infectious diseases, the only ones reported being a few cases of chicken-pox. The severe outbreak of malarial fever in 1916 did not subside until the end of May, 1917, and it recurred towards the close of the last rainy season. The natives continue to take advantage of free issues of quinine made by the Government. Three new cases of leprosy were discovered. These, as with other cases, were isolated and the usual precautions taken. Cases of syphilis in a rather mild form came to the notice of the medical officers. It is difficult to say to what extent this disease permeates the native community, "but," the Government Secretary (Mr. B. Nicholson) observes in his report, "judged by effects on the health and vitality of the people it would not seem to be very prevalent." The average rainfall for the year was 75·7 inches, considerably above the normal.